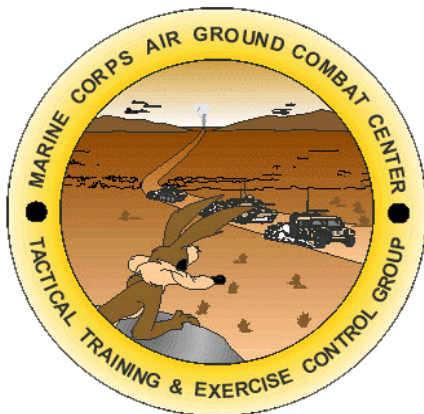

How To Plan a Helicopterborne Assault

A Guide for MAGTF Leaders



**Tactical Training and Exercise Control Group
Twentynine Palms, California**

**Marine Aviation Weapons and Tactics Squadron – 1
Yuma, Arizona**

26 June 2002

Special Thanks to:

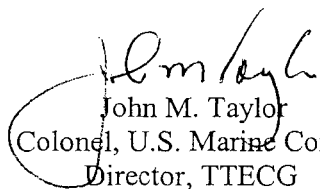
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Prologue

1. This document represents a collaborative effort between the staffs of Tactical Training and Exercise Control Group (TTECG) and Marine Aviation and Weapons Tactics Squadron One (MAWTS-1) in an effort to produce a stand-alone battle book focusing on planning and preparing to conduct a combined arms helicopter assault. The genesis of this effort is linked to the Marine Corps core competency of conducting large-scale (a GCE of infantry battalion or higher) helicopter missions. The details of this planning guide are from lessons learned in Task Force X-Ray (Operation DESERT STORM) and helicopter assault training conducted by the 5th Marine Regiment (Operation SEA-HORSE WIND), MAWTS-1, and the TTECG Helicopter Assault Course (HAC). This document provides a common source of helicopter assault techniques and procedures at MAWTS-1 and TTECG.
2. The strength of "**How to Plan a Helicopterborne Assault**" is its attempt to integrate the warfighting functions of aviation and ground combat, combat support, and combat service support representing a cohesive MAGTF effort. Aside from the five basic doctrinal plans for helicopter assault, the document explicitly addresses planning for reconnaissance, surveillance, and target acquisition (RSTA); combined arms fires; battle handover; command and control; aviation / ground communications; contingencies; and logistics. Additionally, this planning guide provides examples of connectivity charts, PZ and LZ diagrams, objective area diagrams, and FARP diagrams. The emphasis on conducting various types of rehearsals and integrated mission briefs in order to achieve execution synchronization is intentional.
3. This document will be reviewed annually during the TTECG's Course Content Review Board and periodically between TTECG and MAWTS-1. Local reproduction and constructive feedback are encouraged.



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1. This manual is a guide to planning large-scale helicopter operations. It is taken from a base document written and published by the Commanding Officer, 5th Marine Regiment, as the 1st Marine Division's lead in helicopter operations. Tactical Training and Exercise Control Group (TTECG) and Marine Aviation Weapons and Tactics Squadron One (MAWTS-1) amend the document to become the first user-friendly, "how-to" publication for the tactical planner in helicopter assaults.

2. The target audience is MAGTF Staff and Commanders at the Infantry Regiment/Battalion levels. Some examples of integrated planning products that are produced by close coordination between ground planners and aviation planners are shown.

3. All the techniques and procedures, and all of the examples, are based on the METL task, "Conduct a Regimental-sized Helicopter Assault" with the following mission profile:

- Planned, deliberate, large-scale helicopter assault of 40 kilometers – Night or Day
- Regiment inserts multiple infantry battalions, artillery, engineers and other attachments
- Multiple squadrons in support – Multiple waves of mixed aircraft – Possibly multiple AFLs and EFLs
- Multiple Pickup Zones and Multiple Insert Zones
- External loads, both vehicles and cargo, are inserted
- Two days of supply are inserted with the assault force, no ground LOC exists
- The MACCS is established ashore

Company-sized helicopter raids and MEU(SOC)-specific operations are NOT covered.

4. Section II contains notes and background information on large-scale helicopter assaults.

5. Section III is a step-by-step guide to planning a large-scale helicopter assault. Paragraph 3000 and 3001 explain the general planning sequence. The remaining paragraphs explain each step and each planning product in detail.

6. The mission essential task list that follows was developed by the 5th Marine Regiment, which served as the 1st Marine Division helicopter regiment. These tasks are their recommendations on core competencies required in order to conduct large-scale helicopterborne operations.

a.. **Mission:** Conduct a regimental-sized helicopter assault to seize key terrain IOT permit the maneuver of follow-on forces.

b. **Organization:**

- A single commander commands all the forces involved.
- Well-understood command relationships are the first planning priority.
- Regiment consists of three infantry battalions, an artillery battalion, a recon platoon, a regimental HqCo, and a combat engineer company. Multiple squadrons support with multiple AFLs / EFLs.

c. **Scheme of Maneuver:**

- Night or Day.
- Objective is large with each battalion separated by five to eight kilometers.
- Assault is planned and deliberate.

- PZ is NOT the staging airfield.
- 40 kilometers from PZs to insert LZs.
- Multiple battalions from multiple PZs inserted into multiple LZs during single 24-hour period.
- External loads, both vehicles and cargo, are inserted.
- Regiment establishes a fire support base for DS artillery and organic mortars.

d. Admin and Logistics

- Two days of supply are inserted with the assault force. Units carry 48 hours basic load of Classes I, III, V, and VIII. With limited vehicles, regiment cannot resupply battalions on the ground. Aerial resupply delivers straight to using units of Battalion and Company size.
- No ground LOC exists for 48 Hours. Until then, resupply is by air. Resupply should be planned for a single night lift. Resupply pallets need to be standardized.

e. Command and Signal

- Communications with HHQ requires HF. Regiment may have SATCOM with HHQ.
- Communications from RSTA to PZ requires HF.
- VHF communications may require retrans within Objective.

f. Limitations

- Limitations of Helicopter Assault: weather, air LOCs, antiarmor capabilities, aviation fuel.
- Assault force has significant lack of ground mobility once inserted. Few vehicles are inserted.
- Vulnerabilities: enemy attack in AA, PZ or LZ; enemy EA; and disorganization in objective area.
- No host nation support.
- The ground echelon does NOT have the combat power to fight its way into the ZOA

7. Helicopter assault is conducted to hold key terrain (because of the ground's value to the enemy), defeat an enemy force, or establish a facility for FOF. While helicopter forces lack ground mobility, they possess the firepower to seize and hold terrain.

Note: This manual assumes ACE and GCE and/or HHQ staffs have established the fundamentals required for such mission planning to move forward. For example, a warning order, initial table of organization, and operations order should have already been promulgated prior to this helicopterborne assault planning.

1. Helicopter assault planning begins with receipt of higher headquarter's order and the unit's mission analysis. Products from this process are as follows:

- Restated mission
- Planning guidance
- Mission essential tasks
- Rough mission and planning timelines/flow

2. Key mission planners essential for the mission analysis are:

- Heliborne Task Force (HTF) Commander *
- MC
- S-3
- FSC
- S-2
- S-4
- S-6
- AMC
- HUC
- AFL
- EFL

* NOTE: Normally, the MC reports to the MAGTF Commander. However, the MAGTF Commander may decide to delegate authority for the helicopterborne assault to a subordinate commander (e.g., Regimental XO, ACE CO) in order to allow him to focus on the larger battle. In this event, the MC reports to and requests assets from the HTF Commander.

2000

Standards for Helicopter Operations

1. **LZ Standards.** For a well-planned insert LZ, each helicopter in the first wave lands within 100 meters of the planned landing point within 30 seconds of the planned landing time.
 - a. Within 100m for each landing point
 - b. +/- 30 seconds from L-Hour
 - c. Train to 2 minutes to load a helicopter and 1 minute to unload a helicopter. Measure this from first boot contact on the ramp to last boot contact on the ramp.
2. **Planning and Execution Standards:**
 - a. L-Hour is a minimum of 48 hours from mission receipt.
 - b. The assault echelons of two infantry battalions, one artillery battery, one regimental COC, and one engineer platoon are inserted 40k in one twenty-four hour period. L-Hour is during darkness.
 - c. The Regiment fights independently and sustains itself with no ground LOC for 48 hours.

2001 Command and Control in Helicopter Operations

1. Task Organization

- a. The Helicopter Task Force (HTF) is a temporary task organization under a single commander, tasked with accomplishing a single mission. The mission commander establishes criteria to dissolve the HTF.
 - (1) The MAGTF Commander – while leading the battle to accomplish several HHQ objectives – may decide to delegate authority for the HTF to a subordinate. This “HTF Commander” is a non-doctrinal billet but allows the MAGTF Commander to focus on what may be a main effort in another zone or corridor while retaining unity of command – through the HTF Commander – with the helicopterborne force. Without an HTF Commander, the MC reports to the MAGTF Commander.
 - (2) The assault echelons are those forces being inserted by helicopter. The HTF maintains unit integrity as far as possible.
 - (3) The ground echelon are those forces moving over land to link up with the assault echelon. Most vehicles are part of the ground echelon.
 - b. Organic forces from the regiment include multiple infantry battalions, an artillery battalion, a recon platoon, the Regimental HqCo, and a CEB company.
 - c. Supporting forces include multiple helicopter squadrons, possibly organized into multiple waves of mixed aircraft, with multiple AFLs and EFLs. DS aviation units allow the gaining commander (MC or HTF Cmdr) to assign missions, but the aviation commander remains under his higher headquarters command and control. In addition, the aviation commander, not the supported commander, task-organizes his aviation elements. The mission for the aviation element is “DS to the HTF.”
 - d. Supporting forces includes MCSSD in DS. MCSSD is part of the ground echelon that links up with the assault force within 48 hours of insert.
 - e. Attaching artillery, aviation support units, and CSS is non-standard. However, in a far-reaching dynamic helicopter mission, it may be the only way to insure movement and support occur effectively.
 - f. Non-standard command relationships. “Attached for movement” is only for embark, accountability and movement. Once on the deck in the insert zone, the previous tactical relationships apply.
2. **Infantry Forces.** The infantry battalion is the smallest ground organization capable of planning, coordinating and executing an air assault operation. “Battalions insert companies. Regiments insert battalions. Regiment inserts itself.”
3. **Key Personnel/Billets for Regimental/Battalion Helicopter Assaults.** The following pertains to large scale heliborne assaults.
- a. The Mission Commander reports to the MAGTF Commander or HTF Commander. He is normally airborne during the air assault.

HTF	MC	HUC	Force in LZ
Regt	Regt CO	Bn CO	Bn
Bn	Bn CO	Co CO	Co

- b. The HUC is the lead battalion commander.
 - c. PZ Control Officer is Bn XO. The Battalion Bravo Command Group moves with the ground echelon. When multiple units are being moved out of a single PZ, including the regimental COC, they are “attached to the Battalion for movement.”
 - d. The AMC is assigned by the ACE. He directs the planning and execution of multiple squadrons with mixed A/C lifts and multiple AFLs and EFLs. To insure unity of command, the MC and AMC are co-located at all times. Integrated operations are planned and executed by a single command team. When the MC is inserted, he requires immediate communications with the airborne AMC. The AMC and MC need to work the communications equipment hours before the mission commences to insure familiarity. Multiple Mission Coordination Area (MCAs) ensure coverage and visibility.
4. **Long distance helicopter assault operations require well-planned command and control.**
 - a. Task organization. Clearly defined missions. Unit integrity.
 - b. Enhanced communications. RTX Plans. HF expertise. Multiple communications paths. Airborne relays.
 - c. Precision planning. Integrated planning. Contingency planning.
5. **The Command and Control Plan needs to address the three phases of a ground commander’s location:** prior to flight, in-flight, and on the ground. Graphic communications connectivity diagrams need to be built for both commanders in the air as well as separated once the MC is on the ground.
6. **The DASC (or DASC Subordinate i.e. ASLT / ASE) must be physically or electronically co-located with the Regimental FSCC.** The DASC provides “routing and handoff directions to aircraft.” Additionally, within a ground COC, the DASC:
 - a. Provides enemy situation updates to the COC from returning aircraft.
 - b. Provides enemy situation updates to outbound aircraft from the COC.
 - c. Provides FSCM changes and immediate fire mission updates from the FSC to A/C.
 - d. Assists the EFL in the combined arms battle by providing liaison with the FSC.
 - e. Updates COC on status of helicopterborne units and status of assault, CAS, and CASEVAC A/C.
 - f. Collects BDA from returning aircraft and passes to both the FSC, aviation COC (TACC) and to transiting aircraft.
7. **Command Control Helicopter.** During the assault phase of the operation, the AMC and MC fly in the C2 A/C. FSC stays in the COC. Deck-mounted man-pack radios should be brought aboard for backups and for debarking. Multiple MCAs add flexibility to improve communications, visibility or fires deconfliction.

8. **Communications**

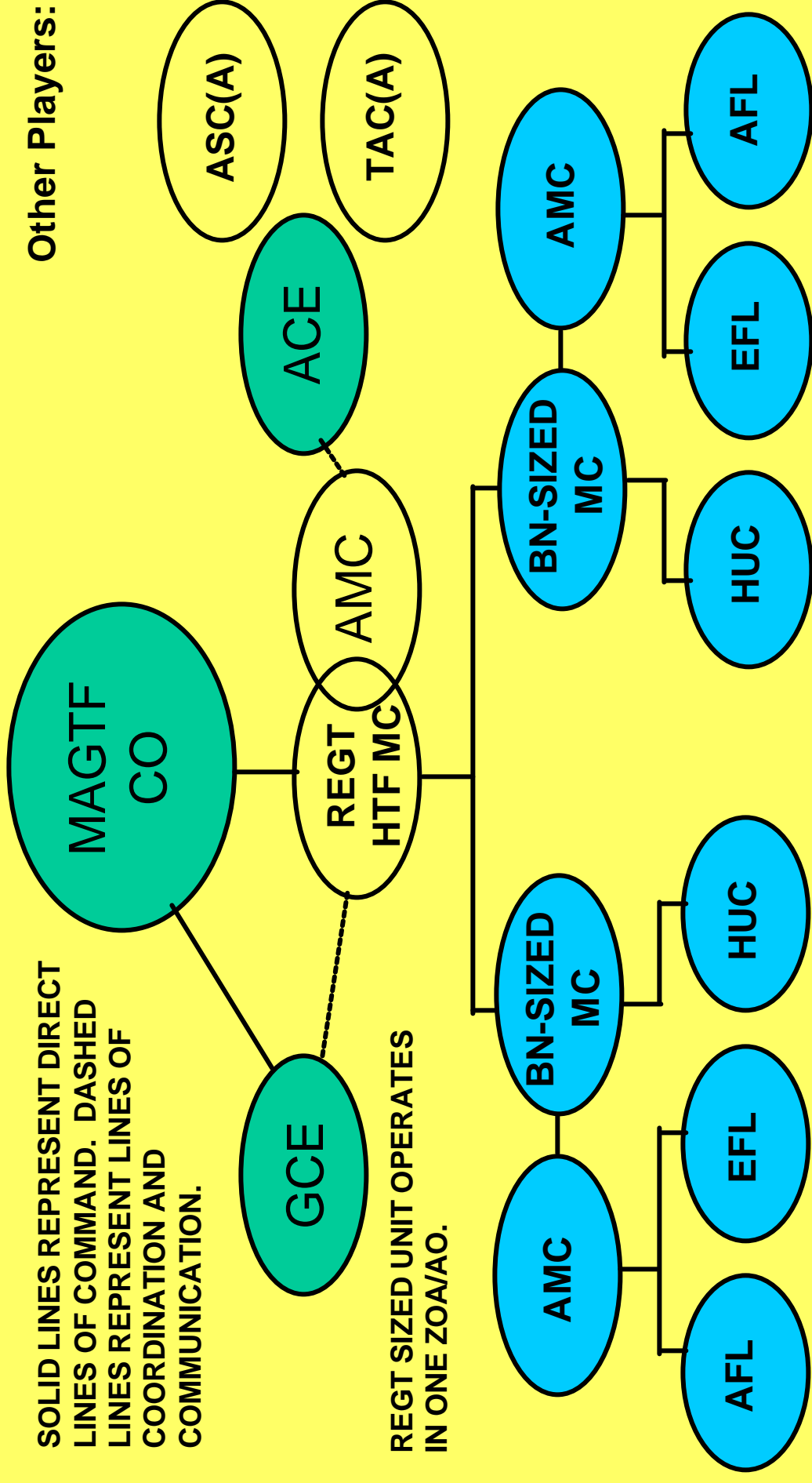
- a. Battalion COCs need a foot-mobile helicopterborne configuration. All radios are man-packed. External antennas are carried. This configuration is very mobile but weak in communications capability. External antennas, OE-254, become critical for foot-mobile COCs. No vehicles also means no mobile relay stations.
- b. A battalion forward COC should consist of no more than (4) HMMWVs for airlifting purposes. The HUC needs long-range communications: antennas and vehicle-powered radios, HF, and a robust RTX plan.
- c. Arty Air Spot (SC/PT) is an alternate for COF (SINCGARS). Artillery still needs to maintain COF, so addition of the Air Spot Net will require another operator to monitor, and the clearance procedures may be slowed.

9. **Zone of Action (ZOA).** The HTF usually takes control of a planned ZOA upon insert. A ZOA increases responsiveness of artillery, mortars and CAS because the HUC clears all fires within his ZOA. Fires originating from outside the ZOA will require HHQ clearance in order to deconflict aviation routing.

- a. The ZOA must be large enough to allow the HUC full use of his organic weapons. An overly large ZOA, however, is difficult to route aircraft around and poses challenges to the HUC's ability to control the ground.
- b. Air Deconfliction. All aircraft entering the ZOA must be cleared through the HUC's FiST unless an ACA is established in the ZOA airspace for aircraft routing.
- c. A ZOA may be activated and deactivated during the course of an operation, even while occupied. A phase line can split a ZOA to allow activation of only half of the ZOA. This allows aircraft to transit the deactivated portion.
- d. A ZOA should specify an associated altitude.
- e. Higher HQ or the HTF must alert adjacent units to the status of the ZOA.

See Sample Command Relationships for Regimental-sized HTF.

Sample Command Relationship For Regimental-Sized HTF



1. Unit Training

- a. Companies need training in LZ inserts and extracts.
- b. Units need battle drills for loading and unloading helicopters. Standard is two-minute load and one minute unload.
- c. Leaders need land navigation and GPS skills.
- d. Units down to platoon level need to have ITG Kits and Marines trained to provide ITG. See Paragraph 3011.
- e. All units need radio training: HF for long range communications, UHF for aviation communications, and aviation communications procedures and products.
- f. Companies need HST capability for aerial resupply and external deliveries. Companies need to be able to execute helicopter CASEVAC.

2. Unit SOPs

- a. Stick Leader Responsibility SOP
- b. Battalion ITG SOP
- c. Battalion PZ SOP
- d. Battalion Air CASEVAC SOP
- e. Battalion Forward COC SOP (Both man-pack and vehicle configurations)

3. Equipment

- a. Small packs are better for helo ops. Large packs are needed for extended ops far from established support. Vector Packs and MOLLE packs are too large for helo ops as they do not fit between a man's legs, and do not stand upright when placed on the deck.
- b. Companies need to carry ALL water jugs. Companies need water purification capability.
- c. Independent units need GPS receivers.
- d. Independent units need LZ Marking Kits.
- e. Marines need to carry double the amount of water normally carried to (4) quarts. Camel backs and two-quart canteens should be issued to Marines.
- f. Leaders of units conducting helicopter operations must be ruthless on individual loads. Tendency on deep inserts is to carry too much equipment, which affects foot mobility. Team rucks are not recommended.

1. Stick Leader Responsibilities. Prior to flight, the stick leader:

- a. Creates three (3) manifests: one for MACO, one for sister stick, and one to retain. Creates a stick card with destination LZ and serial number to communicate with crew chief and pilot.
- b. Maintains accountability, especially of Marines “attached for movement.”
- c. Briefs his people. Inspects Marines to see they are properly prepared for helicopter operations:
 - (1) Individuals fasten helmet chinstraps, insert ear protection; sleeves down; grenades secured; bipods collapsed; loose equipment tied; weapons in Condition 4 with muzzles down; bayonets unfixed; ID tags worn; and radio-telephone operators break down antennas.
 - (2) Marines must embark helicopters in the PZ with full canteens. All loads must be man-portable.
- d. Understands the bump plan. Understands unit’s task in the insert LZ.

2. Stick Leader Actions . During flight, the stick leader:

- a. Upon embarking, give a note to the crewchief that states stick number and intended LZ/Landing Site/Landing Point.
- b. Wears an ICS headset. Maintain situational awareness by listening to cockpit dialog. The stick leader should feel free to ask for situation updates or clarification of that what is heard over the ICS.
- c. Wears a gunner’s belt if given permission to access the cockpit. Regardless of rank, the stick leader’s situational awareness is poor if he has no visual references prior to insert.
- d. Insures his Marines follow the directions of the flight crew. Weapons are placed between legs, muzzle down in CH-46s and CH-53s.
- e. For flights over water, stick leader insures Marines unclasp personal equipment in case of ditching and wear HEEDs or flotation equipment correctly.
- f. Maintains orientation during entire flight by comparing route to map.
- g. Informs his stick of the situation, especially changes to the plan. Using a notebook/small dry erase board and a blue chemlite (for night ops) works best.
- h. Prepares his stick for debarkation. Prior to landing, he signals to load weapons, break chemlites, and put antennas on radios. He indicates north upon landing and gets a final position updates from the aircraft before removing his ICS headset.

3. Helicopter Crew-Chief and Pilot Responsibilities

- a. Keep stick leader informed. Pass changes to enemy situation and changes to plan.

- b. ICS is essential to communicate with stick leaders. (2) ICS cranials and (1) gunners belt is recommended.
- c. Inform stick leader of number of minutes until insert.
- d. On landing, give stick leader a landing card (see diagram) and point direction north.
- e. Keep stick leader oriented during flight by passing position updates and identifying landmarks with stick leader in cockpit.

See example Landing Card.

HELO ASSAULT STICK# _____

Sample Landing Card

A/C# _____

LOCATION: NU 785146

DIR 335° MAG

ENEMY ACTIVITY AT:

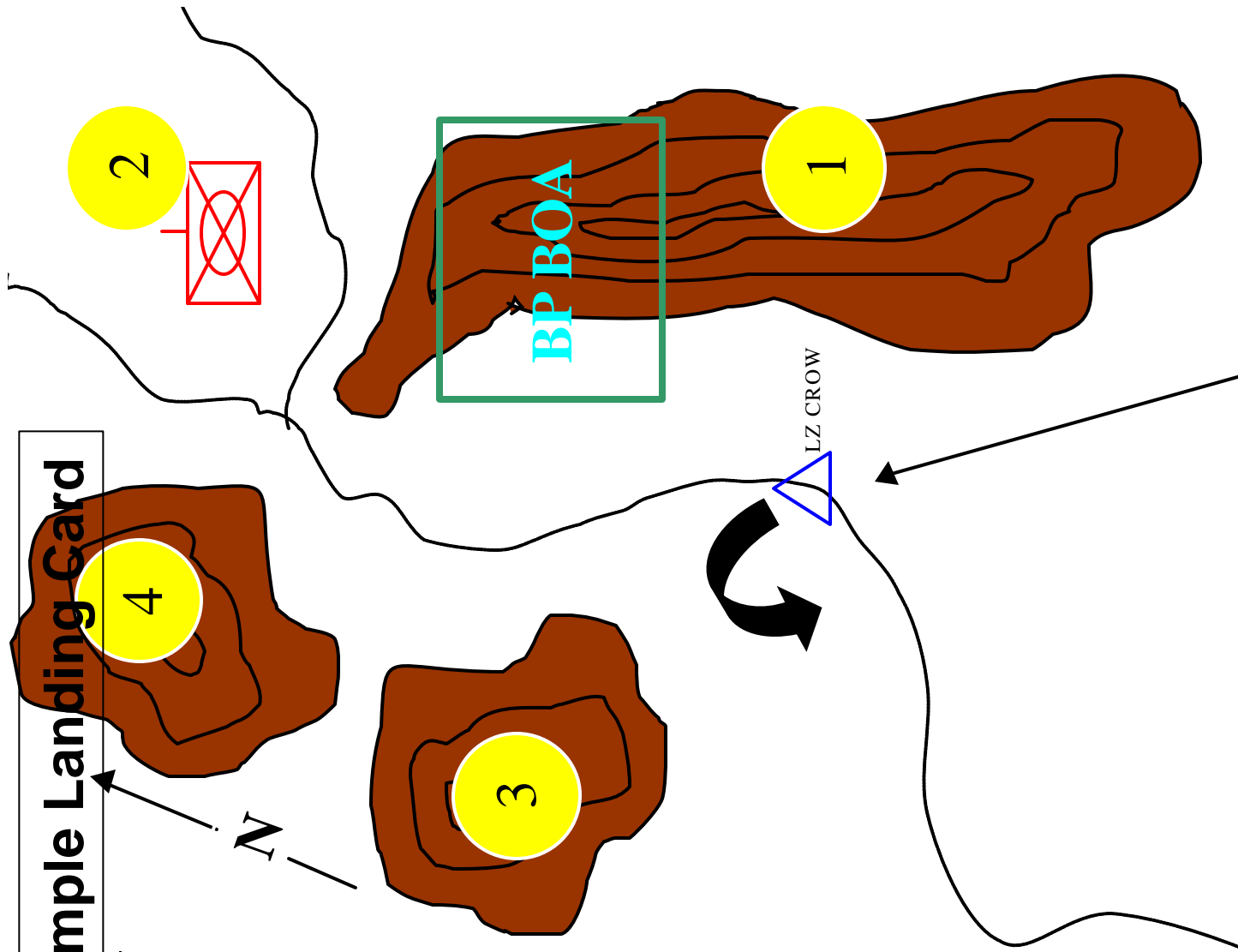
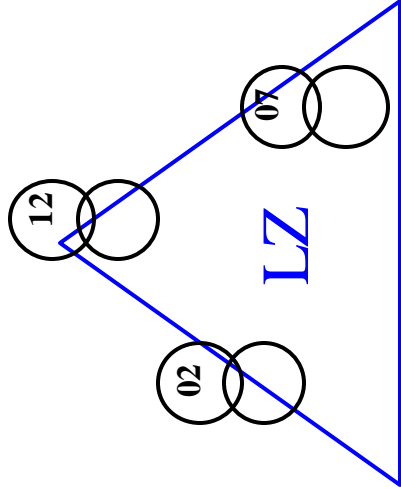
1 (2) 3 4: N 800M

1 2 3 4: _____

FRIENDLY LOC AT:

1 (2) 3 4: N 500M AH-1W's

1 (2) 3 4: SW 1000M RECON(ITG)



Plan the helicopter assault using reverse planning: Start at the objective and plan *backwards*. There are **five basic plans**. Each plan covers a separate phase and contains many planning documents.

1. Create the **Ground Tactical Plan**

- a. Before the helicopter assault is planned, the ground scheme of maneuver must be firm.

b. Products:	Responsibility	Paragraph
Create an OpOrder	MC, HUC, S-3	3002
Create a Collections Plan	S-2, RSTA	3007
Create a Fire Support Plan	FSC	3007
Create a Logistics Plan	S-4	3018
Create a Communications Plan	S-6	3009

*Note: Each functional area of the MAGTF must be involved in operational planning. (e.g., S-4 is responsible for the logistics plan, but must confer with several others to ensure it supports the actions of the objective.)

2. Create the **Landing Plan**

- a. The Landing Plan contains the details of how the helicopterborne task force will be inserted, what fires will support the insert, and the command and control procedures for the assault. The Helicopter Availability Table (HAT) is an important document when planning large-scale assaults, and more detailed discussion of its utility is found in Paragraph 3014, HWSAT.

b. Products:	Responsibility	Paragraph
Create HEALT	MC, AMC	3003
Create Insert LZ Diagrams	AFL, HUC	3004
Create Objective Area Diagram	AMC, AFL, EFL, FSC	3006
Create Connectivity Diagrams	AFL, S-6, MC, AMC	3009
Create Extract LZ Diagram	AFL, HUC	3010
Plan Contingencies	AFL, HUC	3012
Create an Execution Checklist	AMC, MC	3013
Create the Communications Card	AMC, S-6	3013
Create the Mission Timeline	AMC, MC	3013

- c. While the responsibility for the documents listed above rests with certain key players, other planners must be consulted in order for integrated planning. For example, while the HUC and AFL are responsible for the creation of Insert LZ diagram, the FSC and EFL should be involved in its creation.

3. Create the **Air Movement Plan**.

- a. The Helo Routing Plan is completed by the AFL and his planning team. The Fire Support Plan may require adjustment to deconflict helicopter routing or add SEAD targets. Included in this fire support plan for aviation asset routing is employment of the priority target, updating that priority target as aircraft move, and observing the effects on the priority target. Alternate routing needs to

be planned and deconflicted. Logistics considerations are essential and must be included in helicopter route planning—specifically whether a FARP will be required.

b. Products:	Responsibility	Paragraph
Create a Route Plan	AFL	3013

4. Create the **Load Plan**

a. The Load Plan assigns sticks, both Marines and cargo, to each helicopter in each wave. Once the HEALT is complete, the HUC can complete the HWSAT.		
b. Products:	Responsibility	Paragraph
Create a HWSAT	HUC, AFL	3014

5. Create the **Staging Plan**

a. The Staging Plan assembles units in the PZ in preparation for loading.		
b. Products:	Responsibility	Paragraph
Create a PZ Diagram	HUC, HST, AFL	3015
Create a Bump Plan	HUC, HST, AFL	3015

6. Refine the Ground Tactical Plan	Responsibility	Paragraph
a. Refine the OpOrder with Master Control Measures List	MC, HUC, S-3, FSC	
b. Refine the Collections Plan	S-2, I/EOs	3017
c. Refine the Fire Support Plan	FSC, EFL, S-3	3007
d. Refine the Logistics Plan	HUC, S-4, MC, AMC, AFL, HST	3018
e. Refine the Communications Plan	S-6	3009

7. **Identify criteria for standing-down the HTF.** A helicopterborne operation exists until completion of a specified mission. Once the specific mission is completed, aviation and other elements are returned to the control of their parent unit.

1. **Planning Orientation Brief** When the Helicopter Task Force is formed, a planning orientation brief serves to focus the planners and define the planning process. All key ground and air leaders and planners shall be present.

- Post the Planning Timeline. Brief the timeline.
- Brief the Task Organization. Post a list of Key Leaders. Introduce Key Leaders.
- Brief the Enemy Threat.
- Brief the HHQ Scheme of Maneuver, to include adjacent unit locations and actions.
- Brief the HTF Ground Scheme of Maneuver if one has been developed. Have the HUC(s) brief his Scheme of Maneuver.
- Have the AMC brief the aviation assets available.
- Post a Planning Products Matrix. See Appendix D. Step through each line.
- Assign a responsible officer to each product. Assign a due date to each product.
- Post a Master Map. Post the master control measure sheet.
- Brief the standards for the mission: control measures, datum, phases.
- Review the schedule. Announce the Planning Update Time.
- Take Questions.

2. **Sample Planning Timeline**

Planning Orientation Brief	0:30
Integrated Planning	4:00
Planning Update	0:30
Additional Integrated Planning	4:00
Rehearsal Brief	1:00
Modifications	1:00
Brief	1:00

3. **Smart Pack and OpOrder: Integrated Planning = Integrated Brief = Integrated Mission.**

- a. Integrated Planning Produces Integrated Products. The following products must convey the same information and intent in both the final ground tactical plan and the aviation Smart Pack.

Smart Pack

Ground Tactical Plan

- | | |
|--------------------------|-----------------------------------|
| • Objective Area Diagram | App 19: Fire Support Plan |
| • Connectivity Diagrams | Annex K: Communications Plan |
| • HEALT and HWSAT | Annex W: Assault Support Appendix |
| • PZ, LZ Diagrams | Annex W: Assault Support Appendix |

- b. The following products are produced by the AMC for the Smart Pack. To insure complete integration, the MC or HUC needs to *participate* in construction.

- | | |
|-----------------------|---|
| • Cover Sheet | Shows billets, TMS A/C, Callsigns, Nets-Freqs |
| • Communications Card | Complies with ACEOI
Shows LZ Controls, Hasty Encryption
Shows Net IDs, Unit callsigns |
| • Mission Timeline | Deconflicts all units and activities |

- Execution Checklist Selected entries support MC's plan
- c. MC, HUC, and key ground leaders should learn to read aviation-specific documents. Net colors should be understood. Hasty encryption, ATO, and mission callsigns should be understood.
 4. Planning co-location. Ground and air leaders and planners should be co-located for integrated face-to-face planning, briefing, and receipt of ATO. DASC must be part of planning and execution. The MC and key planners must attend the aviation mission brief.
 5. **Notes**
 - a. The horizontal datum must be decided upon prior to any planning. All grids briefed and published must comply. All GPS receivers are loaded with the mission datum.
 - b. The planning cycles for the ACE differs greatly from the planning cycles for the GCE. When detailed planning and the Integrated Mission Brief is complete, two schedules follow it:
 - (1) ACE: Per the mission timeline, the ACE completes Air EFL / AFL briefs, the Flight Briefs, then cockpit briefs. This well-rehearsed cycle needs to be fast in order to meet crew-day requirements. (Oftentimes, ACE planning takes less time than the required GCE oporder briefs, back-briefs, and rehearsals.)
 - (2) GCE: Per the mission timeline, GCE completes Bn OpOrder, Co OpOrder, and Platoon OpOrder, as well as back briefs and walk-throughs (usually 24 hours).
 - c. A mission brief format is included in Appendix E.
 - d. In accordance with HHQ guidance, mission analysis products, and MC criteria, the HTF will at some point disband. These criteria are important so that ACE crews and maintainers can surge aircraft availability for limited times only, knowing MAGTF planners understand there are limitations. Once stand-down occurs, elements of the HTF will return to operational control by their original command or as directed.

1. **The Threat Brief, given by the S-2, informs the key planners of the enemy composition, disposition, and location; intentions; and capabilities and limitations.** This early and continuous focus on the enemy is critical for the orders-development process. The S-2 and S-3 work immediately on a collections plan to solidify current intelligence, answer information requirements, and validate assumptions.
2. **No detailed objective area planning can begin until the MC and the HUC produce a ground concept of operations.** However, concurrent planning will maximize the effort. The ground tactical plan is briefed from a standard operations overlay. At the start of planning with the AMC, AFL and EFL, the outline OpOrder and operations overlay should be complete. At a minimum:
 - Annex A Task Organization
 - Mission
 - Execution: Concept of Operations, Ops / Intel Overlay, and initial Fire Support Plan
 - Significant concerns
 - Key leader comments, for example:
 - Go/No-go criteria
 - Criteria to land HTF
 - Criteria to extract HTF
 - MC, AMC, and HUC list PIRs
3. **The operations overlay should include:**
 - The objective and known threats
 - Initial tactical control measures (MCA, IP, boundary, objective, axis, etc)
 - Each unit and its scheme of maneuver. LZs are NOT specified.
 - Fire support assets, positions, and fire support control measures
 - Planned reconnaissance positions and retrans (RTX) positions
4. **During planning for the helicopter assault, the initial plan is adjusted** Final versions of the OpOrder are completed during helicopter assault planning.
 - a. The Annex B Collections Plan, is updated to reflect RSTA inserts
 - b. The Appendix 19 (Fire Support Plan) of Annex C is updated by the FSC through EFL, AirO, Electronic Warfare Office (EWO), and FW and RW input. The Objective Area Diagram is created with initial aviation and ground battlespace geometry measures.
 - c. The Annex D (Logistics) is updated to reflect aerial resupply operations
 - d. The Annex K (Communications) is updated with the creation of the Connectivity Diagrams.
 - e. The Appendix 3 (Assault Support) to Annex W is created by collecting all the helicopter planning products.
 - TAB J HWSAT
 - TAB K HEALT
 - TAB L Helicopter Landing Diagram / Route Diagram
 - TAB N PZ Diagrams
 - TAB P Insert LZ Diagrams
 - TAB Q Extract LZ Diagrams

1. **ACE and GCE planners recommend insert and extract LZs for MC and AMC approval.** Every insert LZ requires an alternate.
2. **ACE and GCE planners divide the ground force and create waves of aircraft, sized to carry tactical units to specific LZs.** MC and AMC approve these recommendations.
3. **The Helicopter Employment and Assault Landing Table (HEALT) assigns UNITS to WAVES of aircraft to LZs on a time schedule.** The HEALT is a landing timetable.
 - a. One line per wave. Each wave is described by one line of the HEALT. Exceptions include waves separating in flight and inserting into two or more insert zones, waves with different alternate zones, or mixed waves where each line describes a different aircraft type of the same wave.
 - b. All A/C flying to one LZ may *not* have the same alternate LZ. LZs do not have alternates, units have alternates. Splitting flights due to small LZs or alternate ground scheme of maneuver may be done, but is not recommended.
 - c. On-call waves, typically logistics support, are shown as: Wave “O/C.” Units & Serials includes type, amount and notes on specific loads. All other entries are “TBD.”

See example and blank HEALT forms.

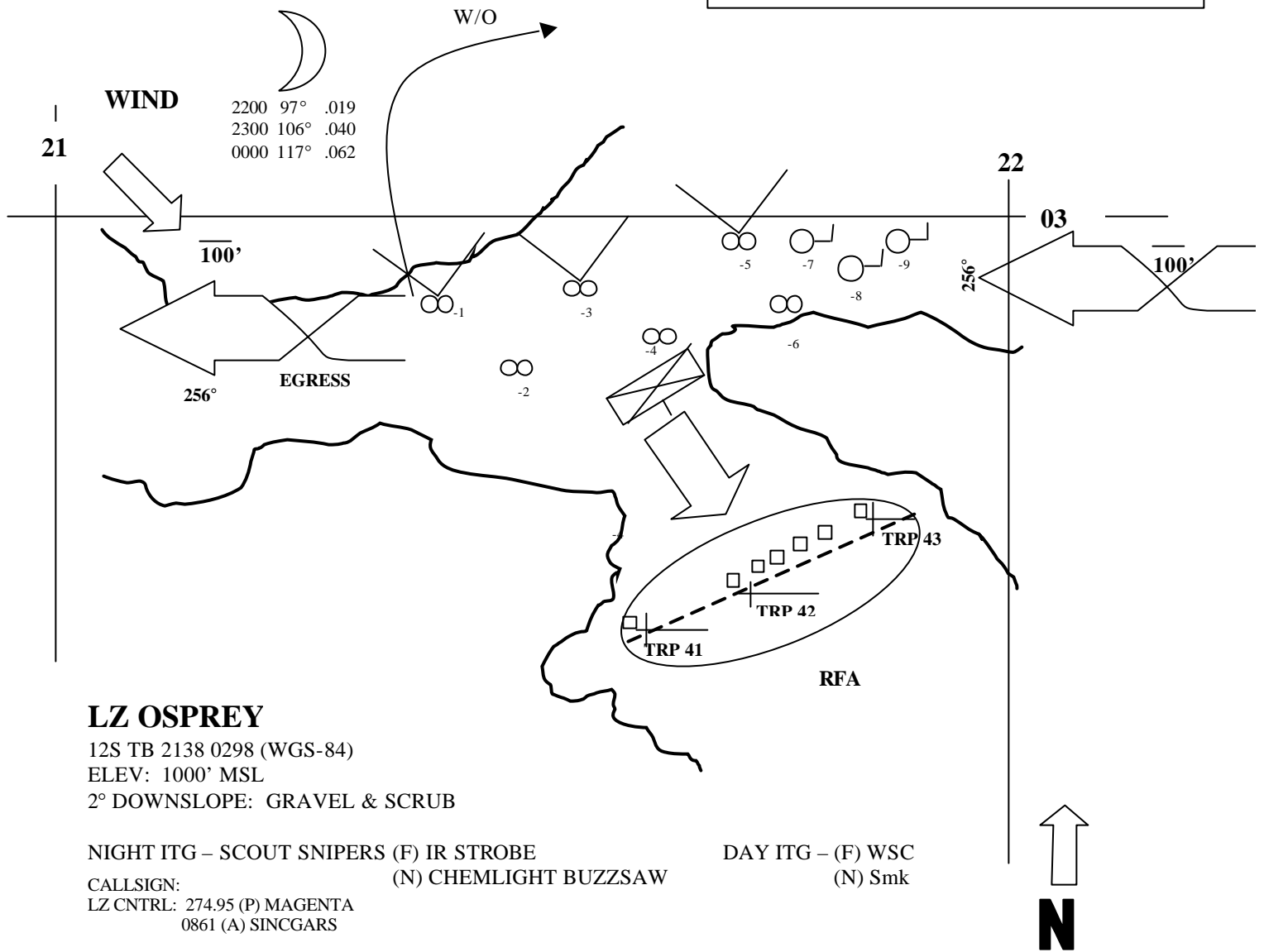
HELICOPTER EMPLOYMENT AND ASSAULT LANDING TABLE

[illegible]

1. **Obtain geo-spatial references (i.e., maps, imagery, etc) of the Objective Area and Insert LZ from the S-2.**
2. **Draw the LZ.** Insure sufficient detail to orient both A/C and ground units.
 - a. A hand-drawn sketch is best. Bold grid lines, add northing and easting numbers. A blow-up of a topo map is adequate but cluttered. Imagery is difficult to draw on. Focus on small details. The size of the diagram should be terrain dependent in order to give perspective. If larger, ground details drop out, helicopters cannot be drawn to scale, and peripheral information clutters the diagram.
 - b. Add a magnetic north-seeking arrow. Make the top of the page grid north.
 - c. A separate product, the Objective Area Diagram, shows the big picture. It also pulls together the command and control, fires in support of aviation maneuver, and FSCM and battlespace geometry necessary to support HTF insertion.
3. **Plan the following details on the diagram:**
 - a. LZ Name
Grid (Horizontal Datum)
Surface Composition
Elevation (feet MSL)
Winds (If winds are unpredictable, show probable winds)
Obstructions / Buildings / Masking Terrain
 - b. A/C Landing Zones, Sites, and/or Points (Draw ITG on the map, draw helicopters to scale)
Landing formation (Dash numbers)
Ingress Direction / Departure Direction
Waveoff Direction and azimuth
Door gunner fields of fire (May change with subsequent waves)
ITG (Day / Night / Near / Far)
Sun and Moon (Time, Direction, Illum)
 - c. Limited Ground Control Measures / Scheme of maneuver
Enemy
Friendly / RSTA / Night details on IR, and markings
Friendly positions of previous waves
Geographical references (geo-refs)
 - d. Communications Details
LZ Control Nets. (Primary and Alternate). See Section 3009.
RSTA
TAD

See example Insert LZ Diagram.

Sample Insert LZ Diagram



1. **Early in planning the MC will specify necessary combat power required in the first wave.**
Considerations for wave timing and composition include terrain, vulnerability vs. threat, etc. Simultaneous landing of as many A/C as possible is desired to maximize combat power on the deck and reduce aircraft exposure time: Minimum number of lifts, maximum number of A/C. With that said, it should be noted that PZ and Extract LZ procedures where less aircraft cycle through in multiple waves are inherently simpler for ground commanders to coordinate.
 - a. Maintain unit integrity as much as possible. This reduces confusion and reorganization time in the insert LZ.
 - b. Ground units need solid plan for moving out of LZ in tactical order. This is especially important if external cargo lifts are inserted and follow-on waves are expected. Insert LZs need to be rapidly cleared of all Marines during multiple wave inserts.
 - c. Linkup plans for multiple wave inserts must work both day and night for both air and ground units.
2. **Immediate re-embark procedures.** It is imperative to have an immediate re-embark NORDO signal for day and night. See further discussion in Paragraph 3012.
3. **If possible, all Insert LZs have ITG.** See Paragraph 3011.

1. **Choose an appropriate style for your objective area diagram.** Although a straight map with pertinent FSCMs and battlespace geometry factors (e.g., gun-target lines, final attack headings, and RSTA locations) displayed is an effective means of conveying information, often times the document can become congested making the diagram less efficient. Considerations should be given to hand drawn objective area diagrams as well as FSCMs overlaid on overhead or satellite imagery. Remember, these documents are not intended to replace maps, only act as a single source document and quick reference to ease cockpit workload.
2. **Consideration must be given during mass production of the objective area diagrams as to the quality of the product.** Often a Xeroxed 1:50,000 map reproduces with more clarity than Xeroxing a PFPS/ computer product.
3. **Consider including the following details on the diagram** (All items below are simply options and should be included only as appropriate; the example following this section is hand-drawn without a map for clarity.):
 - a. **Objective**
 Objective and Objective area details (prominent/key terrain)
 LZs
 Enemy (i.e., threat rings, enemy locations, etc)
 Friendly / RSTA / RTX / Mortar positions / Routes (organic and adjacent units)
 TRPs
 Zone of Action (ZOA) and Adjacent Unit boundaries (for aviation deconfliction)
 - b. **Aircraft**
 Callsigns / Times on Station / Frequencies
 Aircraft control measures
 RWCAS BPs
 FWCAS IPs
 Final Attack Headings
 HAs and MCAs (Elevation AGL/MSL as appropriate)
 Routes and Assault A/C IPs
 - c. **Fires**
 Fire Support Control Measures and battlespace geometry measures
 RFA / NFA (Deconflict team locations from RTX plan and Intel / Collection Plan)
 Targets
 AOF / GTL of artillery / mortars (planned) / gun positions (Both degrees and mils grid)
 Engagement areas
 Assault's Sectors of Fire
 Geographic references (geo-refs) (ensure common vocabulary)
 Risk estimate distances
 - d. **Series Timeline with CAS TOTs and wheels on deck.** (Brief / know task-purpose of each series / group, primary and alternate observers, redundant communications plan, aviation launch triggers, etc. Especially important is the series to support L-Hour.)
 - d. **Battle Handover.** See Paragraph 3008.
 - f. **Communications**
 Air Mission Common

Conduct of Fire

Airspot Net

LZ Control Nets (Primary and Alternate). See Paragraph 3009.

RSTA (e.g., MAGTF Intel, Bn Intel, and Recon Local)

TAD

AFL Common

4. **The single Objective Area Diagram is an integrated document.** Both ground commanders and pilots access identical mission information. Both FSC and EFL create and brief from the same diagram.

See example Objective Area Diagram.

SCHEDULING WORKSHEET

[illegible]

FASK Disrupt enemy plans on CTF Objective 1

PURPOSE: IoT prevent energy fires on building per insertion of G 1/2 while building

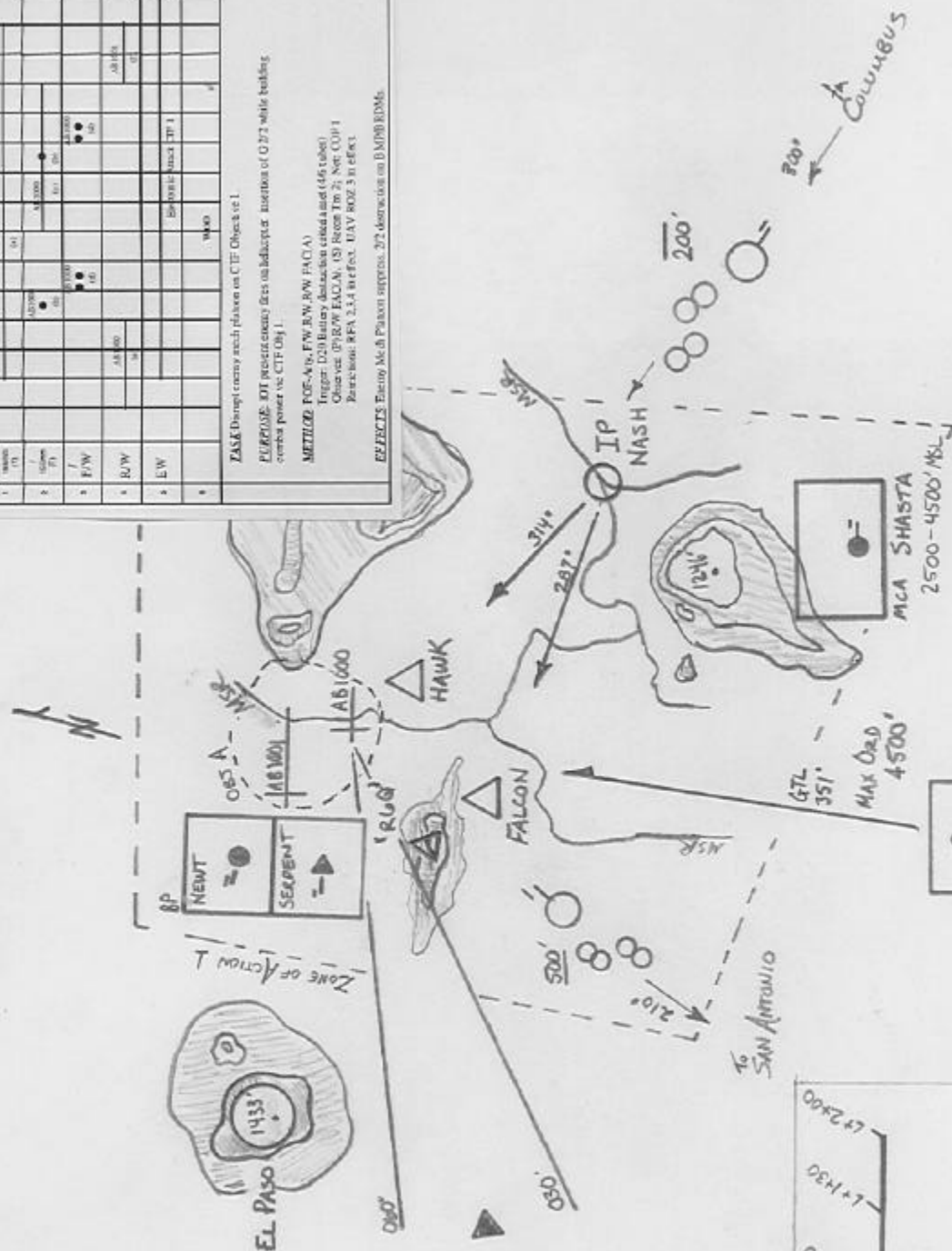
METHOD OF POE AND FSW RW PA(7A)

Trainer: D2.0 Battery destination called a mile (4.6 cubic)

Original: (P)RAW EACNA, (S) Room Tm 2; Net COM1

Particulate: RFA 2.3.4 in effect. UAV ROZ 3 in effect.

KEYWORDS: Energy Med; Platoon success; 2nd destruction on BMDM; RDMs.



DTG
"OPERATION WEDGE"

for status

16
15
14
13

$+10$
 $+9$
 $+8$
 $-8A+C+7$

RGQ	NET 10 325	TEAL
T3M	NET 10 413	BEIGE
VENIM	323.6 (s)	MAUVE
DEUCE	269.85 (s)	TAN
RAGE	255.8 (s)	BROWN
METAL	311.05 (s)	BLONDE

NOT TO SCALE

1. Fires Planning Process

- a. The HTF Commander (through the S-2 and IPB process) tasks RSTA assets to identify HVTs within the HTF area of influence. The S-2 and S-3 task aviation and ground collection assets. Any additional assets may be requested through the MAGTF Commander.
- b. S-2 presents HVTs to HTF Commander and MC. HPTs are identified and are linked to the MC's critical information requirements (CCIRs). These HPTs are matched against the five basic plans (ground scheme of maneuver, landing plan, air movement plan, loading plan, and staging plan) to ensure all threats significant enough to thwart HTF operations are addressed. HPTs are transformed into EFSTs. These EFSTs are the shaping fires and tasks articulated in the HTF Commander's intent.
- c. MC and HUC take the HTF Commander's intent and further develop EFSTs applicable to getting the HTF to the fight and in the fight. Together they develop the task, purpose, method, and effects for each EFST and pass these to either the unit's staff or an ad hoc staff cell for development of the method for conducting combined arms in conjunction with both helicopter and ground maneuver.
- d. Included in the method will be the effects, communications, triggers, and clearance for fires as they synchronize the efforts of all terminal controllers, firing agencies, and FSCC(s). Matching the assets to meet each task's destruction criteria is critical. Participants of all functional areas continue to develop respective PIRs.
- e. EFSTs with associated PIRs lead to identification of NAIs and TAIs. NAIs and TAIs are a focus for observers and terminal controllers to design the various triggers for accomplishing the various EFSTs. The trigger includes measures for launching aircraft in support of EFST actions as well as attack triggers. The architects for developing aviation launch and series triggers are the EFL, HUC, FIST, TAC(A), and FAC(A). Using the acronym PLOT-CR (purpose, target location, observer, trigger, communication, and rehearsal) allows the planners to ensure they have produced the level of detail and redundancy to ensure fidelity of combined arms for each EFST. Annex B, Appendix 19, ATO, and communication connectivity diagrams reflect the detail and redundancy for accomplishing each EFST.
- f. The MC, AMC, and HUC review the planning documents before the information is consolidated into an integrated smart pack. Specific portions of the integrated smart pack reflecting fires are the communications chart, connectivity diagram, execution checklist, and objective area diagram.
- g. A combined arms rehearsal is designed to allow the executors to brief their tasks for each EFST to the MC, AMC, and HUC. These executors are all terminal controllers, firing agency representatives, and FSCC/DASC. Terminal controllers include RSTA elements, FAC(A), EFL, and FiSTs. Firing agencies confirm their triggers and munitions for each EFST. FSCC/DASC representatives confirm ground and air battlespace geometry approval for integrating fires in a safe manner. Scribes record the combined arms elements of PLOT-CR, and their data allows the staff to validate the HTF Decision Support Template. The MC provides the final decision to changes in fire planning. Changes to the integrated smart pack are made. HTF Commander is appraised of the EFSTs so that his COC has the awareness he requires to influence these actions.

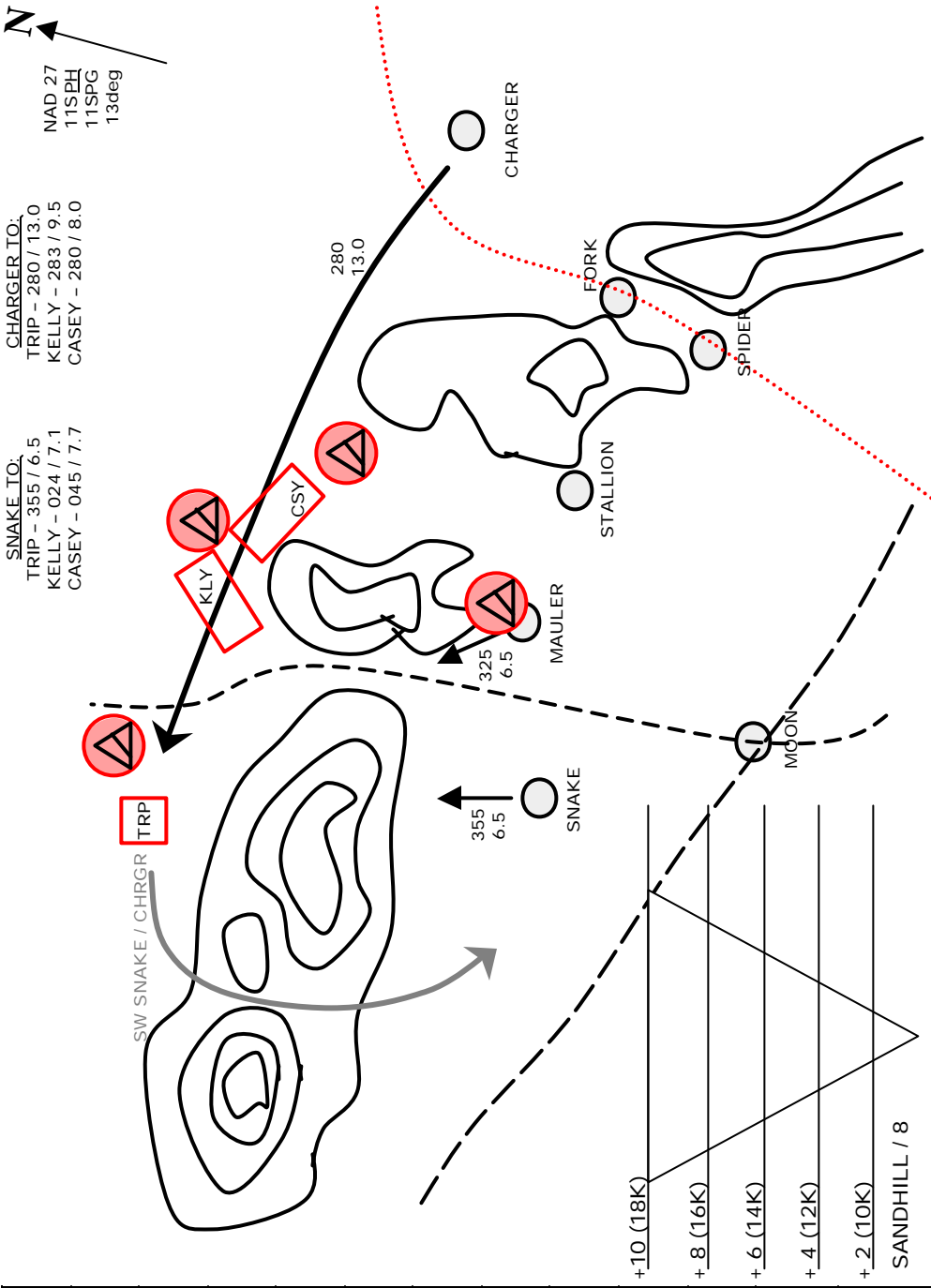
2. **A complete Fire Support Plan is created for a Helicopter Assault:** Appendix 19 (Fire Support Plan) to Annex C (Operations). The EFL, FSC, and Air Officer, with guidance from the MC and AMC, must plan together to integrate air and ground fires as follows.
 - a. Fires in support of the objective and ground scheme of maneuver.
 - b. Fires in support of the helicopter insert.
 - c. SEAD planning.
 - d. Fires in support of extract while in contact with the enemy.
 - e. Employment of FAC(A) for terminal control in support of L-Hour. A “FAC(A) Gameplan” is included and allows a FAC(A) to plan a smooth flow of CAS assets on an objective.
3. **For distant objectives, outside artillery range, artillery can be externally lifted by CH-53E to support the ground scheme of maneuver.** Early insert is best to support follow-on inserts, and immediate enemy response. Details need to be planned:
 - a. External lift procedures. Sending and receiving HST capabilities. Air panels, oriented on the GTL, need to be pre-positioned by the artillery survey team. LZs and PZs must be surveyed for stable soil. Too much dust will result in lost tubes.
 - b. External lift of ammunition. Sending and receiving HST capabilities.
 - c. Gun procedures without forklift MHE, HMMWVs, or trucks
 - d. Insertion of survey teams prior. See Paragraph 3017.
 - e. Organization of ground link-up echelon. Linkup procedures. Inability to linkup due to terrain or enemy situation may require helicopter extract.
 - f. Logistics support and sustainment.
4. **Escort aircraft / FAC(A)s need Artillery COF (SINCGARS) capability.** Air units use COF nets to make calls for fire during movements, insertions and extractions. Pre-planned targets can be requested by RSTA, EFL, FAC(A), AFL, AMC, HUC or HHQ. All assets need to know the plan. Priority targets and triggers need to be established along the insert route.
5. **The Connectivity Diagrams show the critical fire support paths .** Paths from ground units, especially RSTA, to RWCAS and FWCAS, must be shown. The communications plan must support the Fire Support Plan. Fires handover from RSTA to EFL to Company to Battalion to Regiment needs to be shown on the Connectivity Diagram.
6. **For operations outside the range of artillery, aviation fires are the sole assets available .** RW/CAS is the primary support fires that a HUC will receive during insert.
 - a. RW/FAC(A) have SINCGARS.
 - b. RW/FAC(A) fire artillery on COF (SINCGARS), Regt FSC or Air Spot Net.
 - c. EFL precedes the wave into the zone and gives the ‘LZ cold’ codeword, based on go/no-go criteria. LZ cold/hot criteria will be determined by the MC based on recommendations by the

HUC, AMC, AFL, and EFL. LZ cold criteria should be based on available friendly combat firepower relative to enemy forces in a particular LZ and may be different in different LZs. Thought should be given to what is considered not only what is “cold” for the GCE, but also for the ACE as well. EFL or FAC(A) takes BHO from RSTA assets and exchanges information on targets (see Paragraph 3008).

- d. The Connectivity Diagram, Objective Area Diagram, and Communications Cards need to include details of communications between all supported and supporting units.
7. **Air and ground leaders need to be familiar with the retrans plan and relay possibilities:** DASC, TACC, Forward COC, RTX (ACE, Bn, Regt), or airborne node (e.g. DASC(A), ASC(A), TAC(A)). COC can pass intel and operations information to EFL through ASE, or to MC on TAC-1.
8. **Fires deconfliction is a dynamic process.** FSCMs do NOT work by themselves. Aviation and ground battlespace geometry consist of gun target lines, minimum safe distances, surface danger zones, battle positions (aviation and ground units), final attack headings, and stay above / stay below requirements. The integration of all these measures is the line between effective combined arms execution and fratricide. (Gun Target Lines are not a panacea. A GTL only exists while the gun is firing and obviously shifts from target to target.) The FSC deconflicts and approves all fires, and -- in some cases -- pre-clearance in planning and/or rehearsals is viable, tactically sound, and safe. Planners may find that a zone of action (ZOA) for the HTF may facilitate rapid target prosecution, especially when C2 does not allow timely fires clearance.
9. **The FSC must approve all aviation control measures.** Alternate HAs, ACAs and MCAs are planned so that artillery can shoot through non-active MCAs. C&C A/C can alternate MCAs based on phases of air movement, communications or visibility requirements. Multiple BPs are planned for RW/CAS in the following cases: if friendlies block LOS or impact of weapons, if enemy threatens BP, or if PGMs are obscured by dust and smoke.
10. **HHQ should establish an HF FSC-2 net** for long range communications from Bn FSC to Regt FSC and artillery battalion.
11. **The following cycle represents the optimum number of assets needed to effectively incorporate redundancy in executing the combined arms battle:**
 - (2) sets of eyes to locate and identify the target
 - (2) paths of communications connectivity to report the target
 - (2) shooters to prosecute the target.
 - (2) sets of eyes to report BDA

See example FAC(A) Matrix / Gameplan.

MSN			
1. IP			
2. HDNG			
3. DIST			
4. ELEV			
5. DESC			
6. LOC			
7. MARK			
8. FRND			
9. EGR			
TOT			
DTL: FAC: BU/MARK			
BDA			



MSN	ORD (ea.)	TOS	CP/ALT	TIME I/O	BDA	AGENCY	CALLSIGN	FREQ	COLOR
						CONTINUE: TORTOISE			BASE #: SANDHILL / 8
						CHANGE: TROUT			SIGN: LEAFLET
						CANCEL: HIGHBRUSH			COUNTER: ARSON

1. Battle Handover / On station relief (Pass items by exception)**a. Situation**

1. Threat update (SALUTE)
 - (a) SAM / AAA - type, location, time last active
 - (b) Threat aircraft type - location, time sighted
 - (c) Ground forces location - time sighted, recent BDA
2. Friendly / Supported Unit Situation
 - (a) Location / Lead Trace
 - (b) Significant direct fires (Tank main guns, LAV 25mm, etc.)
 - (c) Battlespace Geometry (RW BPs, GTLs, stay above / stay belows, etc.)
 - (d) Callsigns
3. FSC measures in effect (time in effect and coordinates for each)
 - (a) FSCL / CFL / BCL / RFL
 - (b) RFA / NFA / FFA
 - (c) ACA
 - (d) Phase lines
 - (e) Boundaries
 - (f) Zone of Action (ZOA)

b. Mission. Air and/or Indirect Fire Missions in progress / Expected Missions.**c. Execution**

1. Aircraft on station
 - (a) Mission number
 - (b) Call sign
 - (c) Number and type with exceptions from the ATO
 - (d) Ordnance
 - (e) Location and altitude
 - (f) Time remaining on station
 - (g) Frequency
 - (h) Terminal controller / JTAR

d. Admin / Logistics

1. Active JTARs
 - (a) Request number & Time Submitted
 - (b) Terminal controller
 - (c) CAS brief
2. Active ASRs and Type (CASEVAC, Resupply, etc.)
 - (a) Request number and Time Submitted
 - (b) Supported unit
 - (c) Location

e. Command and Signal

1. FAC(A)s on station
 - (a) Call sign
 - (b) Frequency

(c) Location

f. **Recommendations to oncoming FAC(A) or TAC(A)**

2. **Occasions for BHO.** Conduct this dimension during the planning process

a. **RSTA to FAC(A)**

- EFSTs achieved (ADA, counter-recon, etc)
- Status of HPTs (moving, static)
- Enemy: SALUTE, new capabilities introduced
- Terrain Masked Area (A technique is to use the threat portion of Falcon View to show masked areas)
- Friendly Situation / Locations
- Tactical fire nets available (COF, TAD, FSC, etc)
- RSTA & ITG locations

b. **FAC(A) to FAC**

- Enemy SALUTE
- Targets Recorded / Refined / Fired
- Friendly Situation: Assets Available, R/W, F/W, Indirect, RSTA Locations / Nets
- HUC's minimum communications requirements established

c. **FAC to FAC(A)**

- Enemy SALUTE
- Friendly Situation / Locations
- Obstacle Plans
- Fire Plan / FAC(A) Responsibilities
- Scheme of Maneuver / Disengagement Plan
- Status of fires in the objective area

d. **FiST to FiST** (ground link-up with HTF)

e. **Initiation of Fires / Hand-Off Point**

1. **Integrated Planning Process.** Given the complexity of Air/Ground communications in support of Helicopter Assaults, an integrated planning process with active involvement of the MAGTF and subordinate communication officers and chiefs is paramount. Detailed coordination with the MC, AMC, AFL, EFL, HUC, FAC(A)s, TAC(A)s, RSTA Teams, and MAGTF units is required to ensure all Marines understand the communication plan.
2. **Communication Connectivity Diagrams.** Connectivity Diagrams provide an easily reference in picture format of planned communications.
 - a. Recommendations for planning connectivity diagrams.
 - (1) Diagram planned communications links. Minimize the “What If” communication lines. The diagram and other tools within the SmartPack can assist Marines or units who require an unexpected requirement to talk with an agency.
 - (2) Diagram specific RSTA Teams. In most cases, these teams will have specific mission requirements. For example, Recon Tm 2 is planned to do a BHO with the EFL/FAC(A). STA Tm 2 is planned to do ITG for Wave 1. Annotating “RSTA Teams” as one entity on the diagram can lead to confusion on specific fire support tasks or assignments.
 - (3) Plan the layout of the diagram. Every effort should be made to make the diagram clear and easily understood. Minimize the crossing of lines and place units/teams in a logical pattern.
 - (4) Plan for primary and backup communication links. If possible, use different types of radio systems. For example, a Battle HandOver between a FAC(A) and RSTA Team may have the primary net of COF 1 (FH-VHF) and the backup net of TAD 1 (UHF) uncovered. Should equipment fail, an alternate radio system can be used.
 - (5) Call Signs & RTX Plan. Depending on the mission and other coordinating instructions, call signs and RTX may be included. The diagram is intended to display logical connections. All nets within each RTX element should be listed. The SmartPack may have this information in another form.
 - b. Draw all key units and agencies. Insure RSTA units and RTX sites are included.
 - c. Draw the communications links between each agency. All communications paths need two channels, a primary (P) and an alternate (A). Two bands are recommended. Example: Primary TAD is UHF 273.00, Alternate TAD is F350 (S) (or 35.75 SCPT). The preferred alternate path is another band (VHF vs UHF vs HF vs SATCOM).
 - (1) Each communications link shows the primary guarded net on top of the line with the secondary and tertiary link below the line. Non-standard nets have notes in parenthesis. For HQ elements, which guard multiple nets, multiple nets are shown above the line.
 - (2) Include TAD nets from all units to CAS agencies.
 - (3) Include LZ Control Nets for both PZ and Insert LZs. See Paragraph 3009.
 - (4) Include callsigns for each agency.

- d. A single connectivity diagram in an integrated document. Both ground commanders and pilots access identical information.
 - (1) For large helicopter assaults a communications connectivity diagram may be created. The utility of the communication diagram is its ability to show alternate communication paths to reach a specific flight, ground unit, or other controlling agency. Keeping this in mind when designing a communication diagram will ensure the diagram's usefulness. This diagram can be used to augment the ACEOI, guard chart, and -- from an aviation viewpoint -- the Air Tasking Order (ATO). Caution should be used in using actual frequencies on the connectivity diagram for the purposes of security and the increased possibility of error.
 - (2) The Communications Officer should brief these documents to insure ground – air connectivity.
 - (3) The Communications Card for aircrews should reflect all players and actual callsigns. The communications card must be reconciled against the ACEOI and connectivity diagram.
 - e. Sample diagrams. Examples following this section show different connectivity diagrams to demonstrate different levels of detail that can be used depending on the scope of the operation or changes due to different phases in the operation.
3. **An integrated ACEOI and ATO.** Only one agency should be responsible for the update and publishing of the ACEOI and ATO in order to minimize friction that can be caused with multiple documents. Key communication information that should be gleaned from the ACEOI and ATO include:

Communication Connectivity Diagrams
Frequencies/NETID
Call Signs
RTX NETID Plan and expected coverage areas
Hasty Encryption Procedures
Challenge & Passwords

As a technique, a SMARTPACK may be used to organize this information.

4. **SINGARS Ground to Air Communications.** Critical to successful helicopter task force operations is the Ground to Air communication links. Special attention is required to address Battle Handovers (BHOs) and coordinate fires during the shaping/insert phase. All efforts should be given to maximize use of encrypted, frequency hopping VHF radios (SINGARS). Ensure all radios have the correct SINGARS loadset, operators and pilots understand which NETID is appropriate based on the RTX plan, timing is GPS based for all radio systems, and the ARC-210 is functioning properly.
5. **Communication Equipment Considerations .**
- a. Maximize use of the frequency spectrum – VHF (FH), UHF, SATCOM, and HF.
 - b. Understand the equipment. Communicators, Commanders, RSTA Teams, and Staffs need to understand the capabilities and limitations of the equipment. Radio and antenna selection may vary depending on the mission requirements, terrain, and enemy situation.
 - (1) Radio Example:

(a) PRC-119 (FH-VHF) - 4 watt radio system

(b) MRC-145 (FH-VHF) – max 50 watt radio system (2) Radios mounted w/ Power Amplifier

(2) Antenna Example:

(a) RTX Site: PRC-119 w/ an OE-254 to a PRC-119 w/ a 10 Whip Antenna – Effective range would be 8 miles (terrain dependent).

(b) RTX Site: PRC-119 w/ an OE-254 to a PRC-119 w/ an OE-254 – Effective range would be 12 miles (terrain dependent)

(c) RTX Site: MRC-145 w/ an OE-254 to MRC-145 w/ vehicle whip – Effective range would be 25 to 30 miles (terrain dependent).

(3) HF Radio Systems & Antennae. The key advantage to HF radio systems is it requires no RTX and can be effective over long distances. HF is clearly more challenging to use than VHF (FH), but experience has shown that technical proficiency among operators is the key in making HF nets work. When employing HF consider the following:

(a) Type of propagation (LOS, ground wave, near vertical incident skywave (NVIS)) based on terrain and unit locations.

(b) Type of antenna used. Properly made field expedient antennae will work better than tradition antennas (AT-1011/AS-2259)

(c) Operating frequency selected. SPEED/propagation study recommended

(d) Terrain around transmitting site – obstacles and take off angle

(e) Time of Day – “sun up, freq up; sun down, freq down”

(f) Geographic location and distance between stations

(g) Atmospheric conditions

(h) Grounding of equipment

(i) Take-off angle in relation to terrain / manmade obstacles

c. SPEED Analysis. SPEED is a planning tool used to assist in determining feasibility of communications based on terrain, radio, antenna, and frequency considerations. It recommended that a SPEED analysis be conducted to determine VHF & HF communication links between RSTA elements and RTX/MAGTF, as well as the HUC to RTX or MAGTF.

d. RTX Planning. In helicopterborne operations, use of radio RTX and/or radio relay (via aircraft) is inevitable.

(1) Ensure Marines assigned to a RTX site have the requisite skills to effectively install, operate, and troubleshoot a RTX site with minimal guidance.

- (2) Ensure gear is thoroughly opchecked and backup gear and batteries are planned. It is recommended that reporting procedures be establish to report problems on nets and that operators understand the priority of net installation and troubleshooting.
- (3) Planning of RTX sites must take into account the enemy situation and survivability of the team. Escape and evasion plans should be briefed and practiced as well as any destruction criteria of communication gear.

6. Operational Considerations .

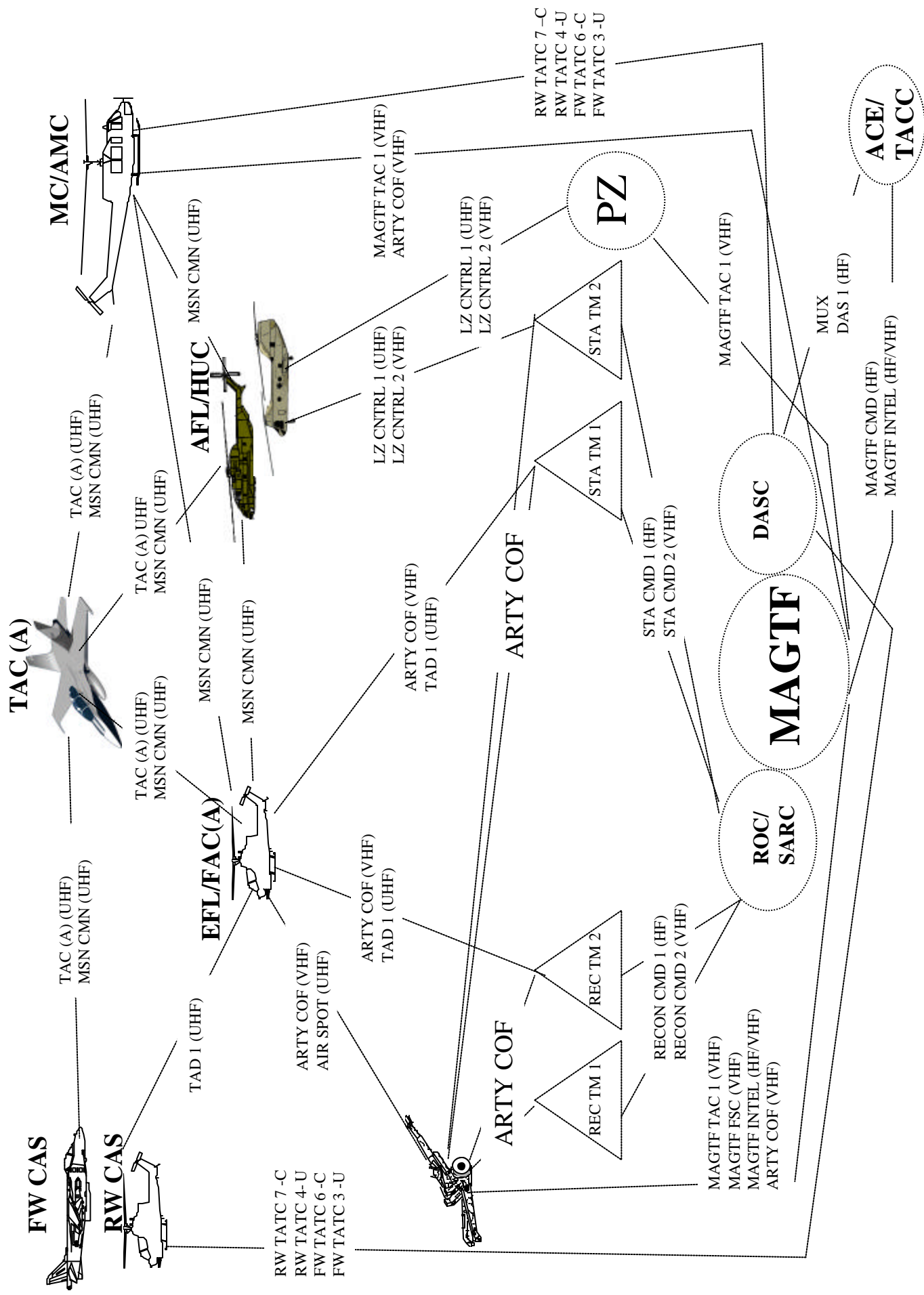
- a. Command & Control Communications. The UH-1 is equipped with the ARC-210 radio system with three (3) radios. This system provides the AMC and MC with UHF, VHF, and FM frequency coverage as well as SINCGARS and HAVEQUICK I and II through each of the radios. SATCOM capabilities are available (non-DAMA) in Radio #3 only. Each radio is capable of scanning four different frequencies with subtle limitations. Typically, the MC and AMC are given control of one radio each, allowing the aircrew to use the final radio, as necessary.
- b. LZ Control Net. LZ Control Nets are critical for successful PZ, Insert LZ, and Extract LZ operations.
 - (1) Every effort should be made to avoid TACPs providing terminal guidance over TAD nets in support of LZ operations. Their focus should be on prosecuting fires. A recommended technique would be to use Bn/Co XO, 1stSgt, CoGySgt, HST, or MMT (if available, MMT is preferred).
 - (2) Establishing LZ Control nets minimizes traffic on Squadron Common, Mission Common, and Tactical Nets.
 - (3) Based on geographical considerations, multiple LZ Control Nets may be required to support multiple LZs and/or PZs. These nets should be designated by zone vice unit.
- c. Understanding the RTX Plan. Depending on terrain and distances, units and aircraft may be required to change NETIDs in order to maintain positive communications. It is critical that all Marines understand the principles of how RTX works, the expected coverage areas of a NETID, and what alternate NETIDs are available to support positive communications. A SPEED analysis can assist in providing a graphic representation of expected coverage area.
- d. Communication Rehearsals. Execution of the plan can quickly fall apart without proper rehearsals and detailed briefings by the actual executors. Ensure that confirmation briefs, combined arms rehearsals, CAST exercises, etc. cover the primary and backup communication plan.
- e. Casualty Evacuation Procedures. In addition to communication plans to support helicopterborne operations, commanders need to plan for and understand the communication plan to support timely CASEVAC. A separate communication plan and rehearsal should be conducted to support CASEVAC procedures. Considerations should include:
 - (1) Terminal Guidance in the Extract PZ. It's recommended that the TACP not be responsible for this duty if engaged in providing supporting fires. An HST or Company Gunnery/First Sergeant may be more suited for this task. LZ Control net can support this task.
 - (2) The DASC coordinate or be immediately informed of any alternate routing of aircraft within the AOR. The DASC is responsible for safe ingress/egress of all aircraft in the assigned

battlespace. A shotgun approach to fragging aircraft for an immediate CASEVAC can result in routing mishaps, especially during night operations.

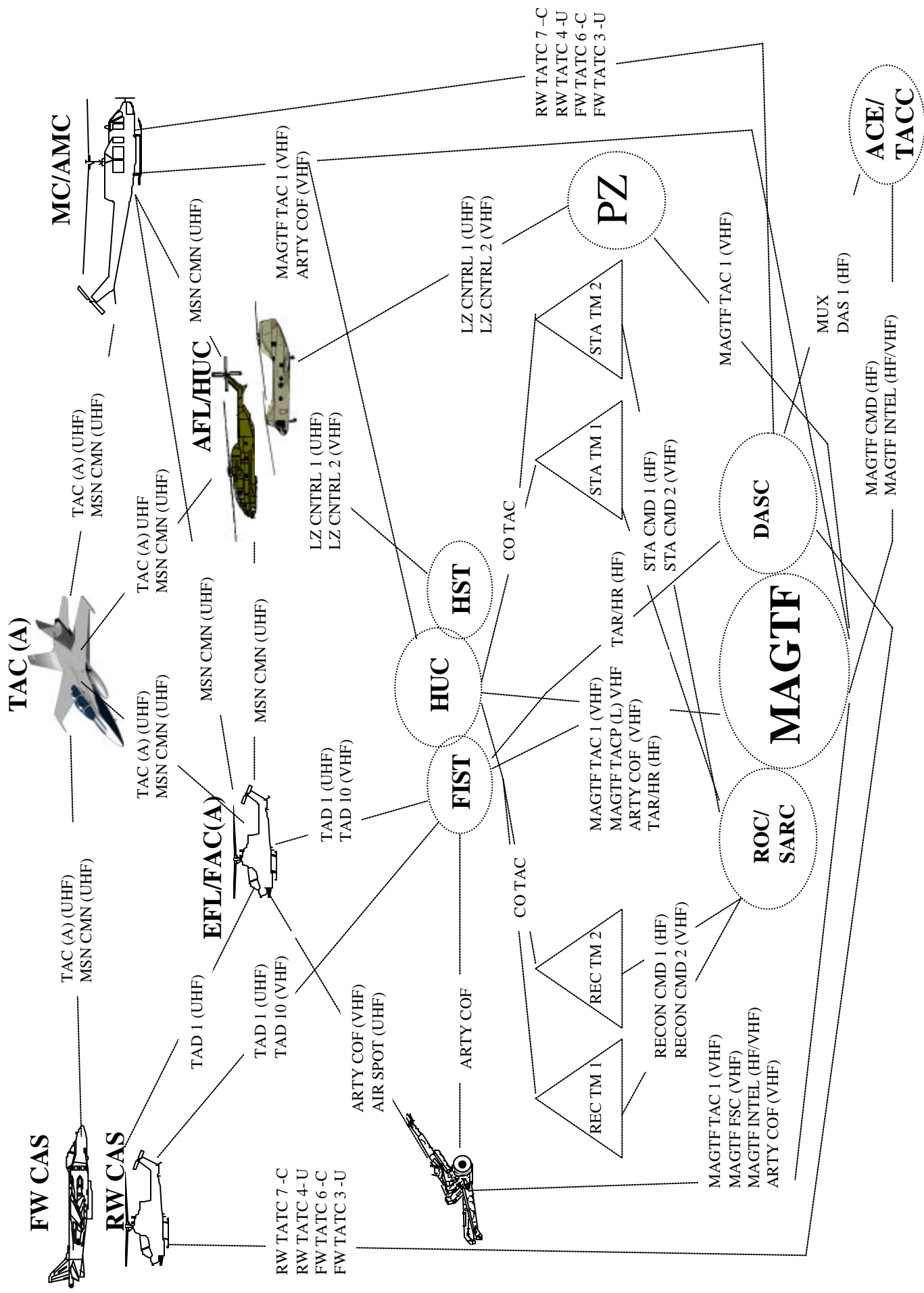
- f. DASC and MAGTF COC Connectivity. DASC, ASE or ASLT augment of MAGTF COC is critical for long-range helicopter operations. Critical communications paths from Regimental COC with TACC and A/C in flight is done best by the DASC. The DASC/ASLT keeps Regimental FSC aware of air fires issues.
- g. RW CAS Contact Point. The routing of RW CAS to the terminal controller of a combined arms action is the contact point. The contact point should provide line of sight communication between the aircrew and the FAC.

See Example Connectivity Diagrams and Radio Capabilities Chart.

NOTIONAL SHAPING/INSERT FOR HELICOPTER TASK FORCE



NOTIONAL ASSAULT/EXTRACT PHASE FOR HELICOPTER TASK FORCE



Radio Capabilities Chart

RADIO	SPECTRUM	FREQ RANGE	POWER OUT	FREQ HOPPING	EMBEDDED CRYPTO	NOTES
PRC-104	HF	2.0 – 29.9999 MHz	20W	NO	NO	Manpack
MRC-138	HF	2.0 – 29.9999 MHz	100W or 400W	NO	NO	Vehicular
GRC-193	HF	2.0 – 29.9999 MHz	100W or 400W	NO	NO	Bench Mounted
PRC-138	HF/VHF	1.6 – 59.9999 MHz	1.5W or 20W	ALE	NO	Manpack
VRC-102	HF/VHF	1.6 – 59.9999 MHz	1.5W, 20W, or 150W	ALE	NO	Bench Mounted
PRC-119	VHF	30.0 – 87.975 MHz	.4W, 1.5W, or 4.5W	SINCGARS	YES	Manpack
VRC-87	VHF	30.0 – 87.975 MHz	.4W, 1.5W, or 4.5W	SINCGARS	YES	1 RT
VRC-88	VHF	30.0 – 87.975 MHz	.4W, 1.5W, or 4.5W	SINCGARS	YES	1 RT
VRC-89	VHF	30.0 – 87.975 MHz	.4W, 1.5W, 4.5W, or 50W	SINCGARS	YES	2 RTs w/ 1 PA
VRC-90	VHF	30.0 – 87.975 MHz	.4W, 1.5W, 4.5W, or 50W	SINCGARS	YES	1 RT w/ 1 PA
VRC-91	VHF	30.0 – 87.975 MHz	.4W, 1.5W, 4.5W, or 50W	SINCGARS	YES	2 RTs w/ 1 PA
VRC-92	VHF	30.0 – 87.975 MHz	.4W, 1.5W, 4.5W, or 50W	SINCGARS	YES	2 RTs w/ 2 Pas
MRC-145	VHF	30.0 – 87.975 MHz	.4W, 1.5W, 4.5W, or 50W	SINCGARS	YES	Vehicular 2 RTs w/ 2 PAs
PRC-113	VHF(AM) UHF	116.0 – 149.975 MHz 225.0 – 399.975 MHz	2W or 10W	HAVE QUICK	NO	Cannot accept time via PLGR
VRC-83	VHF(AM) UHF	116.0 – 149.975 MHz 225.0 – 399.975 MHz	2W, 10W, or 30W	HAVE QUICK	NO	Cannot accept time via PLGR
GRC-171	UHF	225 – 399.975 MHz	30W	HAVE QUICK	NO	Can accept time via PLGR
PRC-148	VHF UHF	30.0 – 224.9999 MHz 225.0 – 512 MHz	0.1, 0.5, 1.0, 3.0, or 5W	SINCGARS and HAVE QUICK	YES	PRC-68 replacement
PRC-117F	VHF UHF SATCOM	30.0 – 224.9999 MHz 225.0 – 512 MHz 243.0 – 270.0 MHz 292.0 – 318.0 MHz	1W to 10W 1W to 10W 2W to 20W 2W to 20W	SINCGARS and HAVE QUICK	YES	DAMA Capable
PSC-5	VHF LOS UHF LOS UHF SATCOM	30.0 – 87.975 MHz 108.0 – 173.975 MHz 225.0 – 399.975 MHz	9W (FM) 5W (AM) 18W (SATCOM)	NO	YES	DAMA Capable
ARC-210	VHF UHF SATCOM – (UH-1N only)	30.0 – 87.975 MHz 108.0 – 173.975 MHz 225.0 – 399.975 MHz	(FM) 10 – 15W (AM) 15 – 23W	SINCGARS and HAVE QUICK	NO (USMC AC radios)	Non-DAMA Capable

- Notes:
1. ALE – Automatic Link Establishment
 2. DAMA – Demand Assigned Multiple Access
 3. ATC Detachment's TSQ-131s were fielded DCS-2000 ARC-210s with embedded crypto that are DAMA capable.
 4. RT – Receiver Transmitter (Radio)
 5. PA – Power Amplifier, the PA with the SINCGARS provides the radio with 50W of power out vice 4.5W on high power.
 6. PRC-113s & VRC-83s must receive the Time Of Day (TOD) from another radio (vice a PLGR) for HAVE QUICK.
 7. LOS – Line Of Sight.

1. **Extract LZ Diagram.** A separate extract LZ Diagram is created for each planned extract LZ. This is done even if the LZ was originally used as an Insert LZ. The communications plan, connectivity diagram, and objective area diagrams should remain the same as far as possible. Extract LZ Diagrams are planned with the same level of detail as Insert LZ Diagrams. An Extract LZ Diagram contains everything that an Insert LZ Diagram has, plus:
 - a. MACO procedures.
 - b. The extract scheme of maneuver includes fires in support of extract. Fires to disengage may include M825 obscuration fires with HE/DPICM to suppress.
 - (1) New FSCM.
 - (2) New targets, including obscuration, in support of the extract.
 - (3) Infantry mortars deconflicted with flight routes
2. **Plan BHO from FAC to EFL / RSTA during the planning process.** See Paragraph 3008.
3. **The AMC needs to consider planning for some number of empty or only partially loaded aircraft on the last flight for straggle accountability.**
4. **The FSC needs to save FS assets for the last wave .**
5. **The LZ Control Officer controls the extract.** The LZ Control Officer establishes communications on the LZ Control Net, passes the grid of the extract LZ to the AFL, marks the LZ, and continually passes updates on the enemy and friendly situation. He knows the number of birds expected and the HUC's extract scheme. Situational awareness and coordination between the HUC and LZ Control Officer is essential.
 - a. The FiST fights the extract fight as long as possible. Before the last wave arrives, the FAC conducts a BHO with an orbiting RW or FWFAC(A) / RSTA. A recommended technique is for the FiST to execute a series which has been previously coordinated with the element receiving the BHO. See Paragraph 3008.
 - b. If the withdrawal is done under enemy pressure, combat power is kept on the ground as long as possible. Sticks do not form up until A/C are in the zone. Fewer A/C per wave is easier for the HUC. The most effective method for withdrawing the force is to shrink the zone by element. This is the quickest method that allows for maintaining combat power, security, good accountability and organization. It is prudent to make this a battle drill.
 - c. The HUC needs direct communications with the AFL, especially if the AMC and the Command and Control A/C are not flying during the extract.
 - d. The MACO keeps the critical count of Marines remaining to be extracted.
 - e. The LZ Control Officer, MACO, and FiST extract with the last wave.
6. **Aircraft Coordination.** For night extracts under pressure, Assault aircraft may mark A/C with chemlites in the windows or change A/C lighting configuration to minimize confusion during loading.

1. **Every LZ needs ONE method of far ITG and ONE method of near ITG:** For every insert zone, every extract zone, every wave. Although radio is always the primary signal, ITG is always emplaced. The no-comm plan is to use ITG only. The AFL will land the lead aircraft as close to the ITG as possible. If necessary, ITG marking may be at a separate grid from the LZ center grid, but must be coordinated with the Assault Aircraft. The LZ Diagram should show ITG position and ITG description for Day / Night / Primary / Alternate. Secondary ITG is needed to differentiate additional landing points for external loads.
2. **Day ITG**
 - a. Far
 - (1) Pyro: Star clusters, star parachutes, Illum
 - (2) Signal Mirror
 - b. Near
 - (1) Smoke. Do not announce the color. Have pilot confirm the color.
 - (2) Air Panel
 - c. Notes on Day ITG
 - (1) Attach (6) cords to each air panel for tie-down purposes. Carry nails.
 - (2) On radio, vector aircraft toward you using the clock method: “***I*** am at ***your*** 9 o’clock.”
3. **Night ITG**
 - a. Far
 - (1) Infrared: IR Strobe. Preferably a programmable Phoenix beacon which emits a code that the pilot can confirm. Strobes can be made directional by placing in 60mm mortar fiber or M-203 barrel.
 - (2) Infrared: IR Laser Pointer ‘Rope’. In general, IR pointers are for marking targets for destruction, not for bringing aircraft to friendly positions. For this reason, an IR pointer shall only be used by a terminal controller (i.e. FAC, FAC(A)) to indicate an LZ and ***will never*** be held ‘steady’ on the LZ. Whenever possible, marking an LZ with an IR pointer should be accompanied by communications and referred to as “Roping” the LZ.
 - (3) Visible Light: Chemlite ‘Buzzsaw.’ Red chemlites work best.
 - (4) Visible Light: Flashlight. Flashlight can be made directional by placing in 60mm mortar fiber of M-203 barrel. Visible red light should NOT be used as it interferes with pilot NVGs.
 - (5) Visible Light: Pyro, Star clusters, Star parachutes, Illum.

b. Near

- (1) Infrared: Chemlite Wind 'T.' The 'T' is the landing point of the first helicopter. Helicopter lands nose into the wind, so that the 'T' is clear. Additional landing points can be marked with a cross. Seven meters between chemlites is standard.
- (2) Visible Light: Chemlite Wind 'T.'
- (3) Visible: Smoke, which is visible to pilots on NVGs, CAN be used on clear, high-light nights, however, battlefield obscuration can diminish effects..
- (4) Infrared: Chemlite 'Buzzsaw.' A chemlite tied on a string, spun continuously in a 6-foot arc.

c. Notes on Night ITG

- (1) Do not use unfiltered (white) strobe as it can be confused with muzzle flashes.
- (2) Passive IR is recommended for Marines on the ground. Glint tape on helmets, IR chemlites on stick leaders. Position of chemlites worn can be used to differentiate units on the ground. Pilots need to be briefed on unit IR procedures: Flashing strobes on FACs, steady strobes on unit leaders, multiple IR pointers for multiple tasks.
- (3) Visible light chemlites can be worn by stick leaders. Colors can differentiate units.
- (4) External lighting on aircraft can be used to differentiate specific helicopters or waves. PZCO must be aware of lighting plan and lighting scheme must be planned and understood by ALL participants.
- (5) Obstacles should be marked with chemlites. Pilots need to be briefed to differentiate obstacles from landing points.
- (6) From the air, colored chemlites are usually more visible than IR chemlites. IR chemlites are *not* as visible on high-light-level nights.
 - (a) The brighter the ambient lux, the brighter the chemlite color needs to be.
 - (b) Red or White is more visible on a high-light night than blue or green. IR or red is more visible on a low-light night.
 - (b) If using colored chemlites, tape two chemlites together at each position. All chemlites need to be doubly secured to the deck to prevent scattering under rotor wash. Primary technique is a stake in the ground. Secondary is a cord tied to a rock or bush.

1. **Immediate Re-embark Plan.** Immediate re-embarkation is the expeditious embarkation of troops either to move them to another location or in response to an insert abort, all taking place in a permissive threat environment (i.e. not under enemy pressure). The procedures **SHOULD** be preplanned and understood by all participants. If the insert is aborted while the A/C are still on deck, in the objective area, Marines re-embark in the same A/C. If the insert is aborted after the A/C have departed the LZ, consideration can be given to collapsing the LZ in reverse order once immediate re-embarkation is requested. In this case, the aircraft which Marines re-embark may be inconsequential. ***ALWAYS PLAN FOR IMMEDIATE RE-EMBARKATION.***
2. **Emergency Extract Plan.** Emergency extract is the extraction of a unit that is in contact with the enemy or unit whose contact with the enemy is imminent. There will likely be an urgent requirement to provide fire support--to enable the unit to break contact and move to an alternate or extract LZ--and then cover the extraction. As with immediate re-embarkation, emergency extract is pre-planned and on call. An alternate LZ, some distance from the objective, should be planned and briefed as an extract LZ. An LZ Diagram is created. Once on the deck, the HUC can adjust his extract plan and pass adjustments back to HHQ. Time/space considerations need to be taken into account, specifically the amount of time it will take for the GCE unit to move from their position to the extract LZ. This will have implications for helicopter fuel planning and holding area planning.
3. **E&R Plan.** The MAGTF S-2 is responsible for the development of the E&R plan in conjunction with ACE and GCE planners.
4. **GO / NO-GO Criteria.** Prior to mission launch, what pre-requisites, either equipment or conditions, need to be met? Local NO-GO criteria do not prevent large coordinated missions.
4. **Abort/Delay Criteria.** Integral to go/no-go criteria is clearly definable LZ hot/cold criteria and what the definition of a hot or cold LZ will be. Once mission is inbound, what constitutes abort criteria, and who has abort/delay authority? Usually, L-Hour abort and delay authority is the HTF commander. Authority to change routes is usually the AMC. Authority to change LZs is usually the HUC.
5. **Contingency planning for waveoffs in the LZ(s).** During planning the AFL(s) and HUC(s) must consider the impact of 1 or multiple aircraft waving off in the zone due to obstacles (brown/white-out, insufficient zone size, threat etc.). For example, do these aircraft go back to the IP? How does this effect the ground scheme of maneuver and follow on waves?
7. **No Comm Plan.** Use of pyrotechnics, chemlites, IR pointers, etc. should be briefed to facilitate performing mission critical tasks in a degraded communications environment. At a minimum, planners should have a no-comm plan for any contingency listed on this page, as well as established signals for no-comm rotary wing close air support.
8. **CASEVAC Plan.** The CASEVAC Plan is a HHQ responsibility. Any CASEVAC plan must conform to the theatre medical plan that is the start point for casualty planning.
 - a. Following the insert, empty A/C can be diverted to evacuate casualties. A robust Landing Plan will have A/C remain on station as contingency CASEVAC A/C.
 - b. CASEVAC procedures must be executable by all separate units.
 - (1) Communication requests for aerial CASEVAC are sent to the DASC if assets in direct support of the mission are unable to fulfill the additional requirement.

- (2) Non-standard communications paths, without the Battalion AirO assistance, need to be clearly understood. A VHF communications path needs to be planned for multiple separate ground units that need to request CASEVAC.
 - (3) ITG detail and procedures. Control of CASEVAC A/C should not be planned for a FAC. One technique is to employ the Co GySgt / 1stSgt in this capacity. A single LZ Control Net should be defined by the CASEVAC Plan. VHF is best for the CoGySgt.
- c. AMC decisions that affect CASEVAC response time, such as refueling, need to be understood by the MC.
 - d. BAS may not be inserted.
 - e. The HTF FSCC will deconflict friendly fires in coordination with the DASC / ASLT for safe routing of the CASEVAC aircraft.
9. **Immediate Re-supply.** All players need to establish and understand the immediate re-supply plan. Locations for pre-staged supplies should be planned for. Consider palletizing these supplies in the PZ to permit rapid helicopter external transportation to ground forces. Ensure HST is planned for in the PZ. The PZ for immediate re-supply needs to be well organized to permit rapid loading of supplies, whether internal or external.
10. **Follow-on Waves.** Regardless of enemy actions, the follow-on waves will likely not go exactly as planned, if for no other reason than the friction inherent in a large scale helicopter operation. Planners should design flexibility into key parts of the battlespace, whether it be holding areas along the helicopter route of flight or initial point (IP), or loiter areas in or around the FARP or PZ. Such planning will allow the operation to flow even when timing becomes de-synchronized due to unplanned events
11. **Downed Aircraft Enroute or in the Objective Area** In the event of a downed aircraft, the HUC and AMC need to have coordinated immediate actions for forces loaded onboard the aircraft as well as a specific bump plan within priorities of the entire flight. Immediate actions should include (but are not limited to) aircraft/site security and preparing for stick shifting between aircraft.

1. The following documents are usually produced by aviation planners. Ground commanders and leaders need to be familiar with the formats and participate in the creation of these documents:
 - Cover Sheet
 - Communications Card
 - Mission Timeline
 - FARP Diagram
 - PZ Diagram
 - HWSAT
 - Spider Routes
 - Obj Area Diagram
 - CAS / FAC(A) Flow Diagram
 - LZ Diagram
 - Execution Checklist
2. **Mission Timeline**. Derived from mission concept of operations. The mission timeline is a graphic depiction of all assets (divisions, flights, ground units, C3) in support of the mission. When properly used during the planning and execution phases, it depicts asset integration as well as essential events, triggers, and time on station limitations.
3. **Objective Area Diagram**. Effective mission planning begins with the objective area. Objective Area Diagrams should be used during mission briefs and execution to provide orientation, a depiction of events, flow of mission assets into the objective area, and battlespace geometry and fire support coordination measures. It should be used as a tool to maintain situational awareness of all players. Refer to Paragraph 3006.
4. **PZ Diagram**. The PZ should be treated as an objective area. It must be simple, briefed in detail, and easily understood by ACE / GCE / CSSE. The PZ Diagram should be treated as an LZ Diagram and depict the most efficient embarkation of friendly forces and equipment. Refer to Paragraph 3015 and 3016.
5. **LZ Diagram**. Graphic depiction of a specific ground area used for planning assault helicopters to embark or disembark Marines or equipment. An LZ Diagram may contain one or more landing sites within the landing zone and one or more landing points within each landing site. Refer to Paragraph 3004 and 3005.
6. **Execution Checklist**. The execution checklist is a tool used by the Mission Commander and others as a one-source document to track the status of specific events in mission execution. The most common mistakes when creating an execution checklist include making the list too long and making it non-user friendly. The events listed should be clear in their meaning i.e. “JTF Objective 1 secure” vice “Objective secure” and should be only used to pass the completion of significant events. The MC fills in his minimum information requirements on a blank Execution Checklist and hands that to the AMC for completion.
 - Do not create a brevity code for series time on targets (TOT).
 - Brevity codes are only initiated by the agency listed on the execution checklist, and passed with a time hack: “BETTY at time four-zero, over.”
 - Prior to an event occurring, questions on the radio do NOT use the brevity code. The proper technique is “What is the status of line twelve?”

- During mission execution, mission aircraft using their Mode 1 IFF can pass checklist items to certain aircraft capable of interrogating IFF. This requires that checklist line numbers conform to specific Mode 1 numbering criteria. The first number must be 0-7 and the second number must be 0-3. For example instead of numbering execution checklist items 1,2,3,4,5...etc, they would be numbered 01,02,03,20,21,23,30,31...etc. Appropriate C&C platforms that are capable of receiving Mode 1 squawks should be briefed to relay information to MC/AMC and HHQ.
3. Time permitting, mission information and/or portions of aviation specific documents should be published in the ATO and SPINS to aid in dissemination.
 4. All key players (to include HHQ, RSTA, RTX, CSS, DASC, ABCCC and MMT) shall receive final Execution Checklists before the mission commences to ensure good situational awareness.

See example Communications Card, Mission Timeline, Spider Routes, and Execution Checklist.

[illegible]

EXECUTION CHECKLIST

LN		EVENT	NET	FROM	TO	VIA	TIME	BREVITY
00	M	R/W Launched	HD-1	EFL	AMC			ANGELS
01	M	F/W Launched	HD-1	DASC	AMC			BRAVES
02	M	Strike on Reg Obj 3 Complete	HD-1	EFL	DAS			CARDINALS
03	M	Assault Pkg in PZ	HD-1	AFL	AMC			DODGERS
10	M	Wave 1 Airborne	HD-1	AFL	AMC			FALCONS
11	M	Wave 1 Inserted	HD-1	AFL	AMC			GIANTS
12	M	BHO to HUC Compl	MAGTF TAC	HUC	MC			INDIANS
13	M	Wave 2 Airborne	HD-1	AFL	AMC			JAGUARS
20	M	Wave 2 Inserted	HD-1	AFL	AMC			JETS
21	M	Assault force commence atk	MAGTF TAC	HUC	MC			LIONS
22	M	MAGTF Obj 1 secure	MAGTF TAC	HUC	MC			MARINERS
30	X	Request resupply	MAGTF TAC	HUC	MC			ANTHRAX
31	X	Request CASEVAC	MAGTF TAC	HUC	MC			BOTULISM
32	X	Request Immed Extract	MAGTF TAC	HUC	MC			CANCER

1. **A Helicopter Availability Table (HAT)** will greatly assist the mission planners in regards to asset management. Due to the size and complexity of a Battalion/Regimental heliborne assault it is highly probable that aviation assets will be sourced from several different ships or airfields. This document should serve as the basis for constructing the HEALT and HWSAT. The AMC or AFL provides the HAT to the HUC who, together with the AMC and AFL, establishes the number and type of aircraft in each wave.
2. **A Lift Matrix** is useful to determine the number of helicopters by type which are required for lifting a specific number of Marines. Such a tool can be programmed in a spreadsheet application, and stick size can then become variable.
3. **The HUC task organizes his force and the AFL assigns sticks to specific helicopters .**
 - a. Commanders should determine stick size for CH-46 early on. One stick equals one CH-46 load, and two sticks fit on a CH-53. During the bump plan, all sticks can be reassigned to any type of aircraft. Stick size limitations are peacetime constraints only.
 - b. Unit leaders and crew-served weapons are spread loaded. Attachment for movement dissolves upon insert.
 - c. External loads, including vehicles, should be assigned a single stick number.
 - d. Each stick is assigned a number in accordance with unit SOP.
 - e. Each stick is assigned a stick leader. The stick leader insures accountability, creates a manifest for the MACO, and leads his stick from the AA through the MACO gate, to the staging point, and onto the A/C.
4. **The (Helicopter Wave and Serial Assignment Table) HWSAT is a personnel assignment table .** It is used by unit leaders, the MACO, the PZCO, and by the AFL and his pilots. Pilots in the PZ use the HWSAT to reconcile the load plan.
 - a. Each line represents a separate helicopter.
 - b. Each column contains information about the specific stick assigned to that helicopter.
 - c. Weight information is critical for helicopter fuel calculations. With weight information, helicopter pilots determine helicopter power required versus power available (given expected ambient conditions). This weight and power planning is essential in ensuring that the ACE maximizes lift to support the GCE. The pound symbol indicates weight: “25#” is twenty-five pounds. All equipment, radios, crew-served weapons and water jugs, should be included. A M998 HMMWV weighs 5200 lbs. The assault support crew will make the utmost effort to calculate an accurate weight of all Marines and equipment.
 - d. The HWSAT should include a list of priority sticks and go/no-go criteria for sticks to accomplish the mission.
5. **For large operations, a separate HWSAT page should be created for each wave.**

6. **The HUC is assigned to the AFL's A/C.** This allows communications and decision making within a single A/C.

See example HAT, Lift Matrix, and HWSATs.

Sample Helicopter Availability Table (HAT)

HELICOPTER UNIT AND DESIGNATION	NUMBER OF A/C	A/C AVAILABLE NUMBER		MODEL	CARRIER	DECK LAUNCH CAPACITY	TENTATIVE LOADS PER A/C		REMARKS (as appropriate)
		FIRST TRIP 90% (1)	OTHER TRIPS 75% (1)				TROOPS	CARGO	
HMM-163 (as assigned)	12	10	9	CH-46E	LPH-2 LHA-1	7(2) 0(2)	16	4,080	All external lift capable.
HMH-463 (as assigned)	16	14	12	CH-53D	LPH-2 LHA-1	4(2) 9(2)	32	8,160	All external lift capable.
HML/A-267 (as assigned)	12	11	9	UH-1N	LPH-2 LHA-1	7(2) 9(2)	8	3,000 (3)	10 armed with GAU/28/A.
HMH-465 (as assigned)	16	14	12	CH-53E	LPH-2 LHA-1	2(2) 6(2)	32(4)	32,000 (5)	Equipped with aircraft recovery sling.
<p>NOTE: 1. These percentages may vary from operation-to-operation.</p> <p>2. These figures represent maximum deck launch capacities from these ships.</p> <p>3. The UH01N has only 220 cubic feet of cargo space and would normally exceed available volume before exceeding weight limitations.</p> <p>4. The CH-53E is limited to 32 troops because centerline seating is not yet available.</p> <p>5. Sea level at 90°F.</p>									

Figure 3-20. Helicopter Availability Table

LIFT MATRIX: WAVE 2

#	#	
	B	C

A = # of Marines w/ "X" No. of Aircraft

B = # of Marines w/ "Y" No. of Aircraft

C = Total # of Marines w/ "X + Y" No. of Aircraft

T/M/S	STICK SIZE			No.	TYPE CARGO / EQUIP.	WEIGHT	TOTAL PAYLOAD
	No.	X	#s/man				PER AIRCRAFT
CH-46E:	12	X	230 +				2760
CH-53D/E:	24	X	230 +			0	5520

GCE GO / NO-GO: 0 Marines in zone

		Number of CH-53E's															
		0	1	2	3	4	5	6	7	8							
Number of CH-46E's	0	0	24	48	72	96	120	144	168	192							
	0	0	0	24	48	72	96	120	144	168	192						
	1	12	12	36	60	84	108	132	156	180	204						
	2	24	24	48	72	96	120	144	168	192	216						
	3	36	36	60	84	108	132	156	180	204	228						
	4	48	48	72	96	120	144	168	192	216	240						
	5	60	60	84	108	132	156	180	204	228	252						
	6	72	72	96	120	144	168	192	216	240	264						
	7	84	84	108	132	156	180	204	228	252	276						
	8	96	96	120	144	168	192	216	240	264	288						
	9	108	108	132	156	180	204	228	252	276	300						
	10	120	120	144	168	192	216	240	264	288	312						
	11	132	132	156	180	204	228	252	276	300	324						
	12	144	144	168	192	216	240	264	288	312	336						

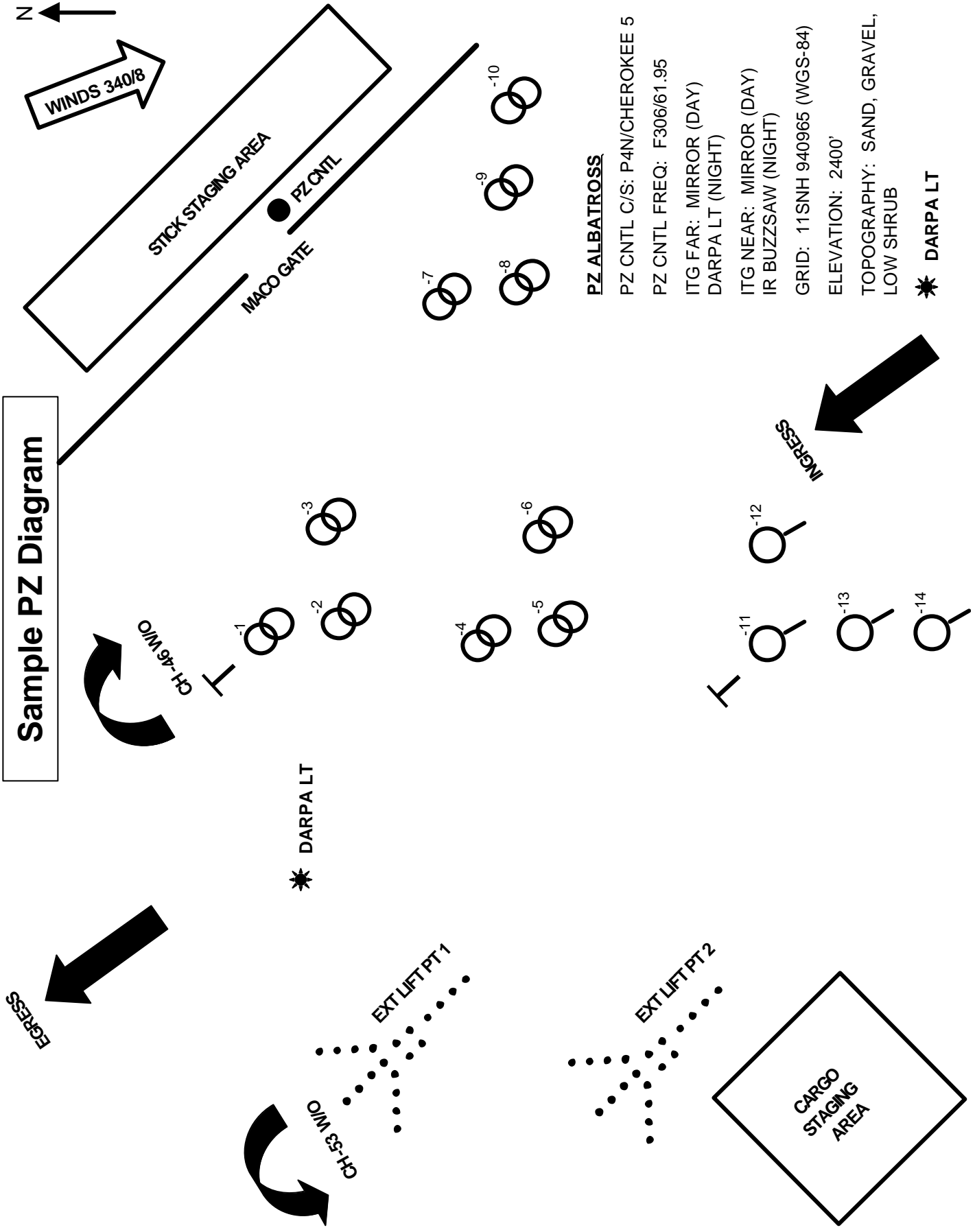
WAVE	HELITEAM FLIGHT SERIAL	TROOP UNIT	NO.	SUPPLIES & EQUIPMENT	PERS	EQUIP	WEIGHT
1	107	Plat Cmdr, 3rd Plat, Co A	1	Normal Combat	220		220
		Radio Operator	1	1 PRC-119	220	25	245
		1st Sqd, 3rd Plat, Co A	10	Normal Combat	2200		2200
			<u>14</u>				<u>2645</u>
	108	Plat Sgt, 3rd Plat, Co A	1	Normal Combat	220		220
		Radio Operator	1	PRC-119	220	25	245
		2nd Squad, 3rd Plat Co A	12	Normal Combat	2640		2640
			<u>14</u>				<u>3105</u>
	201	1st Tm, 1st HMG SQD , Wpns Co	3	1x50 Cal. HMG	660	200	860
		2nd Tm, 1st HMG SQD, Wpns Co	3	1X Mk 19 HMG / HEDP ammo	660	200	860
		1st Sqd, 1st Sect 81mm Plat, Wpns Co	4	1X81mm Mortar/HE and RP ammo	880	200	1080
		2nd Sqd, 1st Sect 81mm Plat, Wpns Co	4	1X 81mm Mortar/HE and RP ammo	880	200	1080
		FDC, 1st Sect, 81mm Plat, Wpns Co	4	FDC gear	880	50	930
			<u>18</u>				<u>4810</u>
	202	1st Tm, 2nd HMG SQD, Wpns Co	3	1X50 Cal HMG	660	200	860
		2nd Tm, 2nd HMG SQD, Wpns Co	3	1XMk 19 HMG/ HEDP ammo	660	200	860
		3rd Sqd, 1st Sect 81mm Plat, Wpns Co	4	1X81mm Mortar/HE and RP ammo	880	200	1080
		4th Sqd, 1st Sect, 81 mm Plat, Wpns Co	4	1x81 mm Mortar/HE and RP ammo	880	200	1080
		1st AA Tm, AA Sect, Wpns Co	2	1 Dragon launcher/2 missiles	440	100	540
		2nd AA Tm, AA Sect, Wpns Co	2	1 Dragon launcher/2 missiles	440	100	540
			<u>18</u>				<u>4960</u>

WAVE	HELITEAM FLIGHT SERIAL	TROOP UNIT	NO.	SUPPLIES & EQUIPMENT	PERS	EQUIP	WEIGHT
2	101	Plat Cmdr, 1st Plat, Co A	1	Normal Combat	220		220
		Radio Operator	1	PRC-119	220	25	245
		1st Sqd, 1st Plat, Co A	10	Normal Combat	2200		2200
		1st Tm, 1st Sqd, Engr Plat	3	Anti-personnel/tank mines	660	200	860
			15				3525
	102	CO, Co A	1	Normal Combat	220		220
		CO Radio Operator	2	2X PRC-119	440	50	490
		FAC Tm #1	3	1XPRC-119/1XPRC-113/1XPRC-104	660	75	735
		2nd Sqd, 1st Plat, Co A	9	Normal Combat	1980		1980
			15				3425
	103	Plat Sgt, 1st Plat, Co A	1	PRC-113	220	25	245
		3rd Sqd, 1st Plat, Co A	11	Normal Combat	2640		2420
		3rd Tm, 1st Sqd, Engr Plat	3	Anti-personnel /tank mines	660	200	860
			15				3525
	104	Plat Cmdr, 2nd Plat, Co A	1	Normal Combat	220		220
		Radio Operator	1	PRC-119	220	25	245
		1st Squad, 2nd Plat, Co A	10	Normal Combat	2200		2200
		1st Tm, 1st Sqd, MG sect	3	1 M240G machine gun	660	50	710
			15				3475
	105	2nd Sqd, 2nd Plat, Co A	10	Normal Combat	2200		2200
		2nd Tm, 1st Sqd, MG sect	3	1 M240G machine gun	660	50	710
		1st Tm Aslt Sect, Co A	2	1 SMAW	440	25	465
			15				3375
	106	Plat Sgt, 2nd Plat, Co A	1	PRC-119	220	25	245
		3rd Sqd, 2nd Plat, Co A	12	Normal Combat	2640		2640
		2nd Tm, Aslt Sect, Co A	2	1 SMAW	220	25	245
			15				3130

[illegible]

1. **Obtain maps and imagery of the PZ from the S-2.**
2. **Draw a large-scale diagram of the PZ.** Include enough detail so that both A/C and sticks can orient themselves on the ground. Add a north-seeking arrow. Make the top of the page grid North, if possible.
3. **Plan the following details on the diagram:**
 - a. PZ Name
Grid (Horizontal Datum)
Surface (include composition and slope)
Elevation (feet MSL)
Forecast Winds
Obstructions / Buildings
 - b. A/C Landing Point
Landing formation (Dash Numbers)
HLZSA (If support area is designated for mixed flights and external loading of CH-53s)
Ingress / Egress Directions
Waveoff Direction
ITG (both far and near)
Sun and Moon (Time, Direction, Illum)
 - c. PZCO location
MACO location
MACO Setup (Staged sticks vs. MACO Gate)
Bump Plan
Easiest Bump Plan is a listing of sticks in priority order. Lowest priority stick is bumped first. HWSAT may show Bump Plan, but PZ Diagram is a more useful document if the Bump Plan is shown.
Straggler Control Point
Bumped Sticks assemble here for the PZCO to assign to later flights.
 - d. Communications Details
LZ Control Nets (Primary and Alternate).
4. **If details of follow-on waves are considerably different from 1st, consider drawing a separate PZ Diagram for each wave .**

See example PZ Diagram.



Sample PZ Diagram

PZ ALBATROSS

- PZ CNTL C/S: P4N/CHEROKEE 5
- PZ CNTL FREQ: F306/61.95
- ITG FAR: MIRROR (DAY)
- DARPA LT (NIGHT)
- ITG NEAR: MIRROR (DAY)
- IR BUZZSAW (NIGHT)
- GRID: 11SNH 940965 (WGS-84)
- ELEVATION: 2400'
- TOPOGRAPHY: SAND, GRAVEL, LOW SHRUB
- * DARPA LT

1. **For large scale helicopterborne operations, multiple PZs are advisable .**
2. **Sequencing of A/C in PZ should mirror A/C order of landing in Insert LZ.** A/C maintain the same dash position in PZ and LZ. This simplifies planning and assists Marines' situational awareness once in the insert zone.
3. **In the PZ, each stick leader should carry a placard containing his stick number and the name of his primary insert LZ.** This card is handed to the pilot once aboard the aircraft. In well-planned inserts, this card will match the information on the HEALT and HWSAT. In hasty operations, this may be the only communication the pilot receives.
 - a. In a large zone, sticks may be assigned specific landing sites . Placard should then include site assignments. (Within the Landing zone are landing sites. Within the landing sites are landing points.)
 - b. If the number of Marines on the stick changes, the placard should note this so the AFL can reconcile his HWSAT prior to takeoff.
 - c. In an airport PZ, crew chiefs can guide sticks from a single staging area to specific aircraft.
 - c. A radio with each stick team facilitates adjustments by the PZCO at the PZ.
 - e. (2) ICS cranials and (1) gunners belt should be provided to each stick leader. The stick leader should be able to have access to the cockpit to coordinate with the pilots. A useful tool to pass information between the stick leader and the rest of the stick is a notebook/small dry erase board. At night, passing this around with a blue chemlite is best.
4. **Each PZ needs a single Pickup Zone Control Officer (PZCO) to organize and control the PZ.** The PZCO insures that the staging plan and loading plan are executed correctly. PZCO for battalion lifts is the Bn XO, Co XO for company lifts, Platoon Sergeants for Platoon lifts. PZCO establishes communications with AFL on LZ Control Net and sticks on the ground. The PZCO:
 - a. Forms a control group:
 - (1) Can include the MACO, ATC, HST, ACE LnO, ROs, guides, security, CASEVAC reps, straggler NCO, and subordinate unit LnOs.
 - (2) The Marshalling Area Control Officer (MACO) is a separate leader who collects manifests and controls accountability at the MACO gate. The MACO works for the PZCO.
 - (3) HST Marines are attached to the PZCO for sending external loads.
 - b. Communicates on three nets:
 - (1) The PZCO establishes communications with the incoming AFL on LZ Control. Primary is UHF. Secondary is VHF (either active-secure or SCPT). PZCO should be able to communicate with MC / AMC airborne, AFL, and EFL, if needed. Incoming AFL briefs the PZCO on the status of the waves to insure that bumps are made prior to touchdown.
 - (2) PZCO has communications with units in order to execute bump plan and move sticks in a large PZ. HST teams communicate with PZCO. ISRs increase PZ communications.

- (3) PZCO has communications with HHQ. For battalions, PZCO has communications with battalion, who in turn maintains communications with Regiment. Intelligence updates on the changing enemy situation are passed from HHQ to the PZCO who passes it along to waiting sticks.
 - c. Plans fire support and plans security for the PZ.
 - d. Clears PZ and marks the PZ. In an established PZ, not much ITG is needed. For large waves, stick staging points need to be measured and marked on the deck. Coordination with the ACE is required.
 - e. Executes the bump plan and repositions sticks within the PZ.
 - f. Ideally, the PZCO is not flying. He either remains behind in charge of the rear COC or leads the follow-on ground echelon to link up with the assault echelon later.
 - g. If flight has a light SOP, usually used for EMCOM launch, PZCO needs to know signals. The PZCO needs to know aircraft marking procedures.
5. **Multiple PZs**. The AMC needs to deconflict helicopter routes in and out of multiple PZs. Multiple PZs should employ MMT from the ACE if they are available.
 6. **A PZ rehearsal is recommended**. Especially if the bump, accountability, and communications plan are to work. In a large PZ, with over a dozen helicopters in the PZ simultaneously - external loads, pax, C&C, escorts - the PZ plan needs to be well understood.
 7. **FARP**. A FARP site will sometimes be located near the PZ. Staging of pax and routing of A/C needs to be deconflicted by the AMC. If this is the case, the PZ should be the post-stage portion of the FARP.
 8. **Water must be resupplied in the PZ so Marines do not fly dry**. Trash must be collected in the PZ.
 9. **PZ Names**. An SOP for naming PZs should be established. PZ names should not be birds. Insert LZs are birds so no conflict is introduced between PZ names and LZ names. Multiple PZ should be marked with different colored signals or panels.
10. **Bump Plan**
 - a. Plan. The easiest bump plan is a single stick priority list. Do not plan separate bump plans for each wave. Do NOT try to cover all possible combinations of helicopters going down - that is the PZCO job. Sticks listed last are bumped first. Do NOT number serials in priority order. Number serials as unit blocks.
 - b. A straggler control point is established at the PZ. Bumped Marines report to the straggler control point. The PZCO is responsible for manning the straggler control point. The MACO needs a plan to account for bumped Marines.
 - c. Execution. Helicopters should arrive according to the PZ Diagram and HEALT. Changes to formations and A/C require stick changes. Ideally, the AFL informs PZCO on LZ Control and the PZCO executes the bump plan *before* A/C are on the deck.

11. External Loads

- a. If a HLZSA is part of the PZ, passengers and cargo loads are staged together. This insures that Marines are not separated when aircraft assignments are changed or the bump plan is executed.
- b. A second HST net, separate from the LZ Control Net, should be established if simultaneous pax and cargo operations are planned in the same PZ.

1. **Units.** Many teams are inserted by helicopter prior to L-Hour. These units do NOT appear on the HEALT. They are all inserted early and planned separately.
 - a. The MC approves ALL RSTA tasks and employment. The S-2 collections plan assigns RSTA tasks. The S-6, through the Communications Plan, assigns RTX assets. Subordinate elements assign additional teams. After all this is done, the S-3 employs the RSTA assets.
 - b. **Each of the following teams needs an Insert / Extract Officer(I/EO) responsible for their insert and extract.** The I/EO assists in planning and executing the single integrated insert and extract plan and reports to the S-3, AMC, or the AFL (depending on command relationships and the commander's desires):
 - RSTA Teams
 - Communications Retrans (RTX) Teams
 - RadBn Sigint Support Teams (SST)
 - Artillery Survey Teams
 - Ground Sensor Platoon (GSP) Insert Teams
2. **I/EO Planning.** The I/EO is involved in producing the following products:
 - A single HWSAT is compiled by all I/EOs to show ALL team inserts.
 - The extract LZ Diagram is produced.
 - An insert LZ deception needs to be planned. Dummy drops and distraction A/C need to be planned with the AMC representative.
 - Contingency Plans are produced: emergency extract, abort criteria, GO/NO-GO criteria, alternate LZs, bump plan, no communications, and E&R plan.

While the I/EO is not responsible to produce a HEALT, objective area diagram, connectivity diagram, or PZ diagram, he must ensure critical information and briefing products are provided to the RSTA teams. Mission essential coordination continues to take place after the insert of RSTA, and they will not be read into the plans without subsequent briefs, which is the responsibility of the I/EO.
3. **I/EO Coordination.** The following products need to be checked by each I/EO to insure his team is represented and protected.
 - The Connectivity Diagram is checked to insure communications paths are supportable.
 - The Objective Area Diagram is checked to insure an RFA is placed around each team.
 - The Execution Checklist and Communications Card are checked.
4. **I/EO Responsibilities.** The I/EO:
 - a. Plans quickly. Insert is usually 24 hours before L-Hour. ASRs for insert are passed to the AirO for consolidation. Replenishment and extraction of the teams needs to be planned.
 - b. Prepares his teams: equipment inspections and team rehearsals, especially loading and unloading the helicopter.
 - c. Attends the aviation mission brief. Changes made after insertion are avoided. When forces are inserted early, changes to net IDs, encryption, FSCM and scheme of maneuver, need to be passed by radio. During extracts, details of plans need to be passed by radio to the extracting unit.

- d. Is located in COC during operations? With what staff principals?

5. Reconnaissance Notes

- a. Reconnaissance success is dependent on established communications. RSTA teams must know the communications plan and understand their dependency on the RTX plan. Communications connectivity needs to be walked through during rehearsals. If necessary, a separate earlier rehearsal should be done to support early inserts.
- b. BHO from RSTA to EFL and then to HUC needs to be well understood. Refer to Notes on Fire Support Planning (Paragraph 3007).
- c. ROC must be co-located with MAGTF COC (SARC) throughout entire operation. Separate movement induces additional communications problems.
- d. RSTA teams should know to roll to Co Tac for direct reporting during critical points in the battle. This does not change command relationships.
- e. RSTA teams need UHF communications. with aircraft to update on-station A/C, and VHF Communications with HUC. Cycle of reporting to unit in PZ needs to be clear.
- f. When RSTA assets are limited, units should use organic teams for ITG responsibilities.
- g. LOS studies should be done to analyze all potential reconnaissance positions prior to insert using threat portion of Falcon View.

6. RTX Notes

- a. Subordinate units coordinate retrans with HHQ in order to consolidate and coordinate the priority nets needed to be retransmitted. Combined teams are attached to one leader.
- b. The number of nets to be retransmitted is limited. Air and Ground Nets need to be retransmitted. The S-3 sets net priorities.
- c. Planning factor is two men per net per two days. One kilometer of movement is the maximum realistic expectation. To retrans four nets for three days, ten men need to be inserted. During helicopter operations, vehicle inserts are usually not an option.
- d. Redundant teams need to be planned and inserted. A communications backup and no comm plan must be done.
- e. As a secondary mission, the collections plan should task RTX teams with observing enemy sectors. Maps, binos, and knowledge of the operation should be standard for all RTX teams.

1. **If the helicopterborne task force is planning on extraction, unit trains and support CSS elements are not displaced forward.** If the assault force is to link up with other forces, CSS elements move forward with the ground echelon to link up.
2. **Logistics plans, especially at long distances, are communications dependent.** The communications plan must support the Logistics Plan.
3. **Initial LOGSTATREP is submitted prior to assault.** Thereafter, 'by exception' reports can be submitted from the units in the field.
4. **Assault units can only be expected to carry 2 DOS, excluding water.** The MAGTF can increase its immediately available supply stockage by having Marines on secondary waves carry bulk supplies - cases of MREs, full ammunition cans - on the A/C and turn over supplies to S-4 upon insert. The S-4 should publish a list of standard supplies for all classes and all equipment. Units maximize supplies going in to minimize resupply requirements.
5. **Forward Arming and Refueling Point (FARP) requirements.** A FARP of some sort will likely be required to sustain a large scale helicopterborne assault. Although FARP planning and execution will be largely an ACE issue, some FARP requirements may affect all MAGTF MSEs. FARP establishment and build-up may have to be a separate and distinct phase of the operation, and may be a go/no-go criteria. Multiple FARPS may facilitate an operation. Separate assault and skid FARPs can be tailored (layout, ordnance requirements) to better meet specific mission needs, as well as increase helicopter throughput and turnaround time. This will increase the assets required to support the effort. Depending on the size and scope of the helicopterborne mission, the CSSE may need to augment the ACE's MWSG to provide all required assets for the FARP. If a prepared or improved dirt airstrip is available and KC-130 capable, an RGR may be appropriate. Thought should be given to using the CH-53E Tactical Bulk Fuel Dispensing System (TBFDS). This capability lends itself well to sustaining RW Skid assets in the CAS/Escort/FAC(A) roles. Consideration must be given to how use of KC-130 and CH-53E assets for these purposes will affect overall MAGTF needs.
 - a. The following are planning factors that Aviation Ground Support Personnel must know to facilitate their planning and execution of a FARP:
 - Location (if not already identified)
 - Aircraft (number and type) to use the FARP(s)
 - FARP Operation Time
 - Time Aircraft Arrive
 - Time Aircraft Depart
 - Type of Refueling required (Hot/Cold)
 - Number of Refueling Points needed
 - Required Fuel Quantity
 - Quantity and type Ordnance required
 - # Ordnance personnel required to support
 - b. Considerations which must be planned for and will involve other elements of the ACE (i.e. MACG) and MAGTF:
 - Intelligence personnel required to establish an intel cell at the FARP (similar to the FLIC)
 - Method of building up the FARP
 - Ground or Air
 - Requirements for FARP resupply during mission
 - What and how much?

How to get it there?
Security Required
 Ground Security
 Air Defense (Passive/Active measures required)
Command and Control
 Communications connectivity required
 Marine Air Traffic Control Mobile Team (MMT) requirements
 Airboss Requirements

*****If aviation assets are to be used for building up and/or resupplying the FARP, HWSATs and HEALTs will need to reflect this. The AMC must advise the MC on how use of aviation assets will affect other parts of the operation, particularly if GCE combat power build-up time will be increased.***

6. The scope of helicopter support required during large scale helicopter operations is significant.

For example, a regiment requires:

- (27) CH-53 sorties to carry (27) M-149 Water Bull per day. (Nine per battalion per day).
- Ammunition resupply
- CASEVAC on-call
- Chow resupply / Maintenance & parts resupply
- Daily movements of people / reconnaissance / additional assault operations

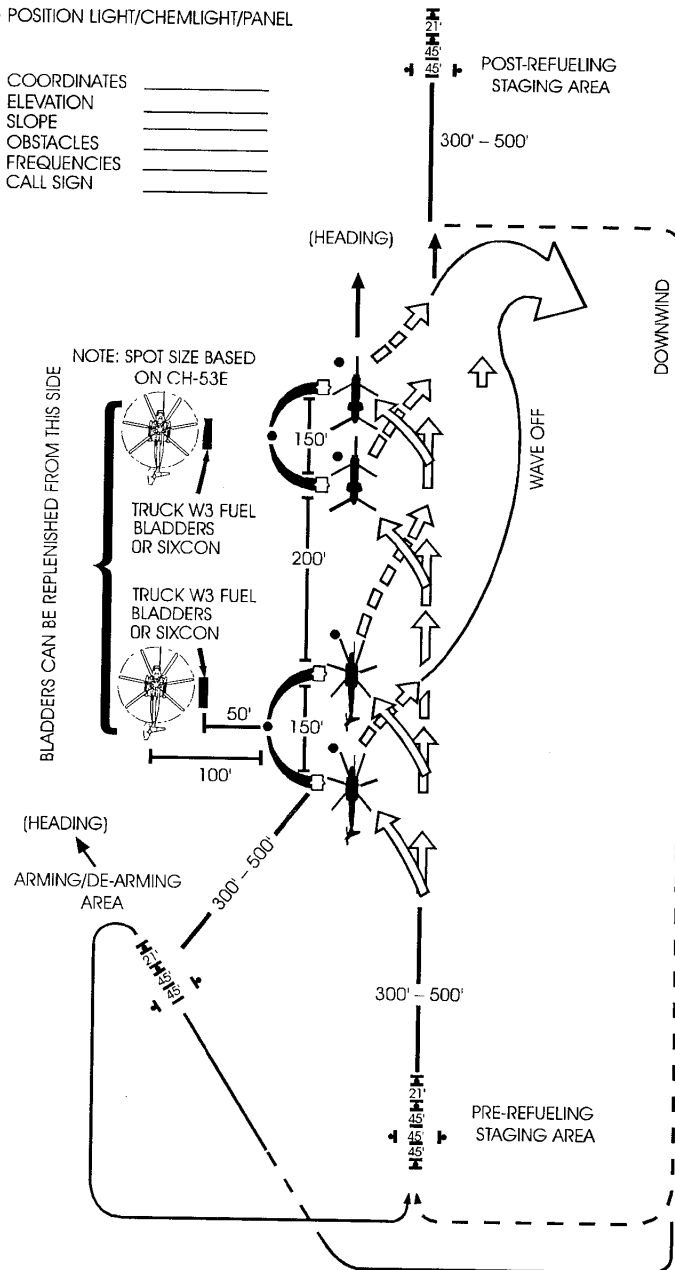
See example FARP diagrams.

Sample FARP Diagram (1)

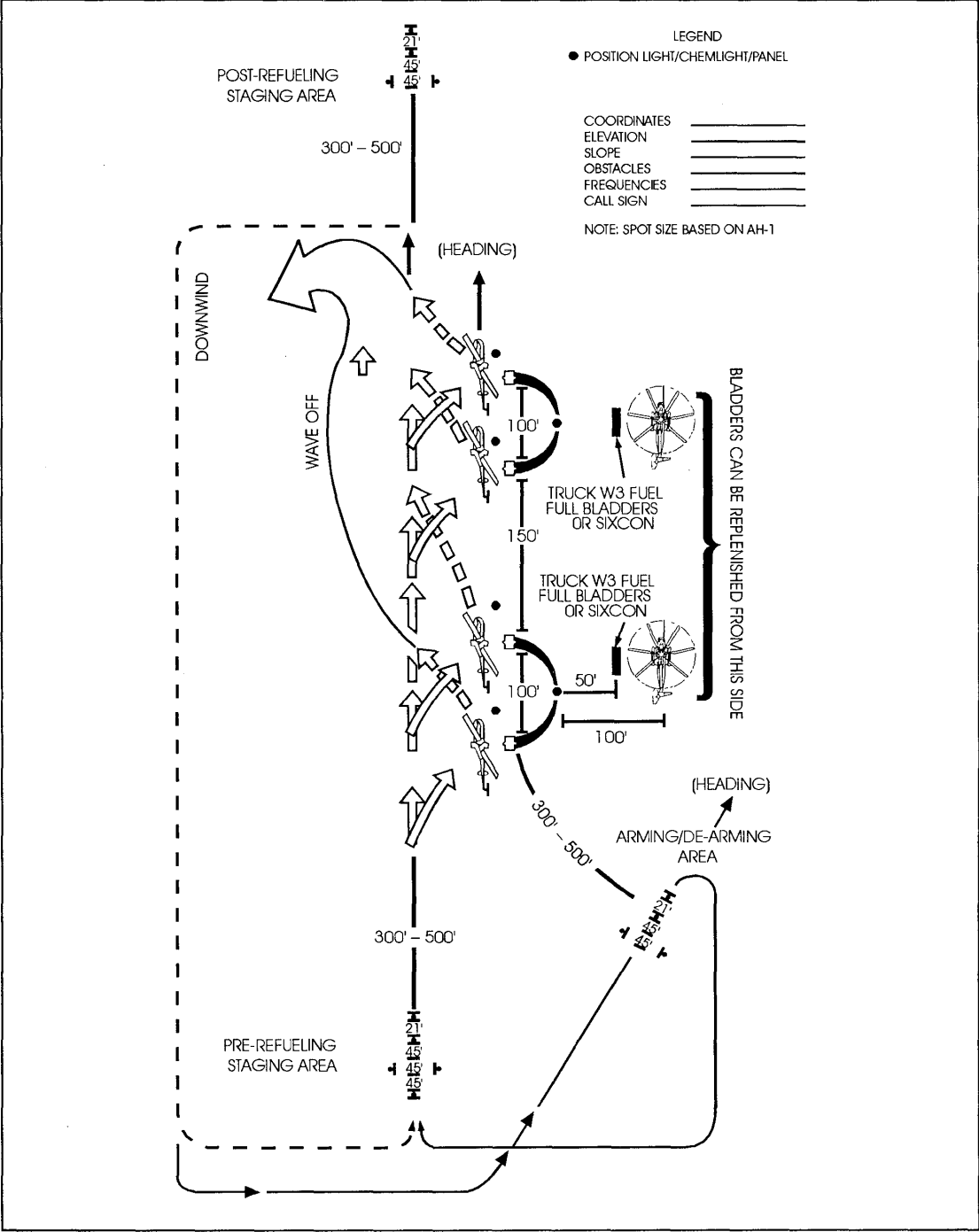
LEGEND

- POSITION LIGHT/CHEMLIGHT/PANEL

COORDINATES _____
 ELEVATION _____
 SLOPE _____
 OBSTACLES _____
 FREQUENCIES _____
 CALL SIGN _____



Sample FARP Diagram (2)



1. **Immediate Water Resupply must be scheduled in the initial waves.** Infantrymen will consume 3 to 4 gallons of water per day in an arid environment with rolling terrain.
2. **Canteens**
 - a. Marines must embark helicopters in the PZ with full canteens. Water needs to be provided in the PZ immediately prior to launch.
 - b. Marines need to carry double the amount of water normally carried to (4) quarts. Camel backs and two-quart canteens should be issued to Marines.
3. **Jugs.** Infantry units should insert with every water jug they own.
 - a. A designated team of Marines, a “mule-team,” should be assigned to unload and stage water. This same team can fly back and forth inside a helicopter for water jug resupply. The last A/C of the last wave in each LZ should carry jugs and the mule-team.
 - b. (1) 10k net load of water cans = (4) 48 x 48 pallets. Each pallet holds (60) 5-gallon cans. Total weight of (1) pallet = 2400 pounds. Total weight of load = 9600 lbs = 240 cans = 1200 gal = .33 DOS water for infantry battalion. This is driven by having no Material Handling equipment (MHE) available.
4. **Water Bulls**
 - a. Both Ch-46Es and CH-53Es can lift a full water bull depending on ambient conditions. Empty water trailers can be too light to be externalled by CH-53E, but can be lifted by CH-46E.
 - b. If water bulls can only be lifted into pre-planned LZs, units need to be prepared to use mule-teams to move water from LZ to the unit. Water must be landed as near ground units as possible.
 - c. A 900-man infantry battalion needs (9) M-149 water trailers per day. Attaching these assets to the battalion provides the needed sustainment, but restricts mobility because no organic battalion vehicle can move them. Full water bulls can only be pulled by a HMMWV in an emergency situation. Empty water bulls can be pulled by a HMMWV.
5. **Local Water.** The local supply of water should be exploited. Marines need water filters and purification tablets. Regiment needs access to a water purification unit. Medical sections need to be prepared to test and treat water, engineers need to be prepared to purify water. The S-2 needs to brief the availability and potability of the local water source.

1. Tactical Bulk Fuel Delivery System (TBFDS)

The TBFDS should be considered when planning a helicopter operation. It is carried internal to a CH-53E providing an airmobile refueling asset. This allows the TBFDS to refuel escort helicopters and ground vehicles. In the list below are some initial planning considerations.

2. TBFDS specifications / limitations

20 GPM	Combined in-tank fuel pump transfer rate (per tank)
45 GPM	Flow thru each delivery point of a dual point setup(300PPM)
78 GPM	Single point setup fuel flow (500PPM)
90 GPM	Dual point setup total fuel flow (585PPM)
102 GPM	TBFDS transfer rate into aircraft fuel tanks (660PPM)
110 GPM	Flow limit into TBFDS tanks
112 GPM	Flow into 3 TBFDS tanks using 30PSI thru pressure refuel point
800 gal.	Amount per tank (max)
400 gal.	Training (max) unless authorized by exercise commander
3 tanks	Max tanks per aircraft

*Gravity and pressure refueling nozzles available. Aircraft can only provide JP / Aviation fuel.

1. **Ammunition resupply must be planned in on-call helicopter waves.**
2. **LOGPACs.** Units should prepare ammunition LOGPACs to insure standard packages resupply loads. Standard LOGPACs can be defined and built by unit S-4s and staged at the edge of the airfield. All LOGPACs need to be able to be lifted by hand. Medical supplies need to be planned in LOGPACs.
3. **Pallets.** Palletized ammunition can be delivered into the LZ, however, Infantry Regiments and Battalions have no internal MHE or banding equipment for dealing with pallets. Pallets that are comprised of multiple man-pack loads can be lifted into an assault LZ. Realistic consideration needs to be given as to how palletized equipment will be unloaded—"Make it happen" might not be feasible in terms of time and combat-capable Marines.

1. **Units request resupply on TAC-2.** Long-haul communications from Objective / Insert LZ to PZ requires HF support for the S-4. This request cycle needs to terminate at the PZ Control Officer or HST Det OIC in the HLZSA.
2. **External vehicle and net loads**
 - a. Battalions should tailor their Forward COC , Log Train, and hard-back gun vehicles into serials of no more than (4) vehicles (no trailers) to insure rapid inserts. Consider dual-sling HMMWV underneath CH-53Es.
 - b. External loads are dependent on available slings, cargo nets, and cargo bags. The sending unit is responsible for PZ ops, acquiring and rigging all loads. The aviation unit is responsible for advising the sending unit on external loads and recovering the sending units cargo equipment in the insert LZ. The receiving unit is responsible for LZ control and the trained ground crews to receive equipment.
3. **Resupply.** Infantry units require dedicated Helicopter Support Team (HST) capability, either organic or attached.
 - a. Infantry battalions need an organic HST capability to receive resupply. Infantry companies and separate units need an organic HST team for receiving helicopter external loads. These teams need HST kits: gloves, grounding rods, and static wands. Cargo nets and slings must be temp-loaned from TSB.
 - b. Transportation Support Battalion (TSB) can attach HST to infantry units to insure sending and receiving capability. HST as a DS unit is not dynamic enough for planning, rehearsal, insert, movements, and security concerns.
 - c. HST teams need UHF communications with A/C and VHF communications with supported unit. HST teams need to talk to A/C on LZ Control Net. A separate LZ Control Net may be required for large lift with multiple external loads.
 - d. During PZ Ops, HST teams are attached to the PZCO. HST teams need communications with PZCO and A/C.
 - e. Standardized, pre-planned resupply LOGPACs, netted, if possible, should be staged at the PZ for rapid resupply operations.
 - f. Consider that internal loading of helicopters for resupply will require longer periods in the PZ and LZ, than would resupply by external load.
 - g. If KC-130 A/C are available, consideration of aerial re-supply via air delivery is a technique. If this is planned, there will need to be Air Delivery Platoon personnel (from the FSSG's Transportation Support Bn Air Delivery Platoon) available.

1. The following is an example of what one artillery battery might require IOT shoot and survive while ahead of the supply train in a helicopterborne assault. Thinking in terms of lift, it is not hard to see that the requirements are so significant that it basically becomes another helicopterborne assault. Obviously, this list would change/be tailored per the mission and commander's guidance.

- a. Section Gear. This includes all SL-3 gear related to the individual section, such as Motor T, Communications, Supply, Gun Section, FDC Section, XO's Section, Btry Gunny's Section, etc. This also includes any gear that does not need to be loaded onto a pallet, such as crew-serve weapons, extra fuel cans, water jugs, batteries, MRE cases, small ordnance (claymores, AT-4s), and all other bits and pieces.
- b. Cannons: 6 M198 Howitzers (SL-3 gear loaded in section trucks)
- c. Vehicles:
 - 8 5-Ton trucks (loaded with section gear)
 - 2 Hardback HMMWVs (loaded with section gear)
 - 6 Highback HMMWVs (loaded with section gear)
 - 1 Lowback HMMWVs (loaded with section)

Each of these vehicles would probably be loaded to their maximum carrying capacity for weight and size.

- d. Trailers/Etc.:
 - 1 Generator (loaded with extra fuel)
 - 2 M101 trailer (loaded with section gear)
 - 1 M105 trailer (loaded with section gear)
 - 1 WaterBull (full / 400 gallons)

Each of these trailers would probably be loaded to their maximum carrying capacity for weight and size.

- e. Ammunition:
 - 846 155mm Proj / D544 @ 24per pallet / pallet wt 2391lbs / pallet dimension 27"L X 41"W X 32"H (35full/1 partial pallet)
 - 846 Prop Chgs / D541 @ 40 per pallet / pallet wt 1350lbs / pallet dimension 55"L X 40"W X 45"H (21full/1 partial pallet)
 - 846 Fuzes / N340 @ 848 per pallet / pallet wt 1743lbs / pallet dimension 44"L X 52"W X 32"H (1 partial pallet)
 - 930 Primers/ N523 @ 500 per box / box wt 62lbs / box dimension 25"L X 12"W X 12"H (1full/1 partial box)
 - 20 AT4's / C995 @ 5 per box / box wt 78lbs / box dimension 36"L X 47"W X 11"H (4full boxes)
 - 6960 rds Ctg 7.62 / A131 @ 800 per box/ box wt 80lbs / box dimension 18"L X 12"W X 9"H (8full/1 partial box)
 - 1754 rds Cal .50 / A576 @ 200 per box/ box wt 77lbs / box dimension 15"L X 13"W X 9"H (8full/1 partial box)
 - 1230 rds 40mm MK19 / B542 @ 1344 per pallet/ pallet wt 2100lbs / pallet dimensions 50"L X 38"W X 38"H (1 partial pallet)
 - 20 AP Mines/ K143 @ 6 per box/ box wt 18lbs/ box dimensions 10"L X 14"W X 12"H (3full/1 partial box)

- 36 Sig Flares/ L312 @ 36 per box/ box wt 55lbs/ box dimensions 15"L X 14"W X 14"H (1 full box)
- 250 Frag Grenades/ G881 @ 30 per box/ box wt 53lbs/ box dimensions 20"L X 12"W X 13"H (8 full/1 partial box)

All other ammo would be carried on person / in packs

f. Chow:

74 cases MREs (can be loaded as section gear)

g. Water:

38 5-gallon cans (can be loaded as section gear)

h. Personnel:

131 Combat Loaded Marines (85 pounds gear in pack + some Marines carrying approximately 15-35 pounds gear in hands)

Appendix A

Glossary

AA	Assembly Area
A/C	Aircraft
ACE	Aviation Combat Element
AFL	Assault Flight Leader
AGS	Aviation Ground Support
AirO	Air Officer
AMC	Air Mission Commander
ASC(A)	Assault Support Coordinator (Airborne)
ASLT	Air Support Liaison Team
ASR	Assault Support Request
CE	Command Element
CSSE	Combat Service Support Element
EFL	Escort Flight Leader
EW	Electronic Warfare
EA	Electronic Attack
EP	Electronic Protect
ES	Electronic Support
FSC	Fire Support Coordinator
GCE	Ground Combat Element
Geo-ref	Geographic reference
GTL	Gun Target Line
HEALT	Helicopter Employment and Assault Landing Table
HLZ	Helicopter Landing Zone
HLZSA	Helicopter Landing Zone Support Area
HTF	Helicopterborne Task Force
HUC	Helicopterborne Unit Commander
HWSAT	Helicopter Wave and Serial Assignment Table
I/EO	Insert Extract Officer
LOC	Line of Communications
LZ	Landing Zone
MACO	Marshalling Area Control Officer
MAGTF	Marine Air Ground Task Force
MC	Mission Commander
MCA	Mission Coordination Area
MHE	Material Handling Equipment
MMT	Marine Mobile Team
PZCO	Pickup Zone Control Officer
ROC	Reconnaissance Operations Center
RSTA	Reconnaissance, Surveillance, and Target Acquisition
RTX	Retrans
SC/PT	Single Channel / Plain Text. Non-freq-hopping on SINCGARs
ZOA	Zone of Action

Appendix B

Assault Support Appendix to OpOrder

Appendix 3 (Assault Support) to Annex W (Aviation Operations)

TAB C	Assault Support
TAB H	Helicopter Availability Table
TAB J	HWSAT
TAB K	HEALT
TAB L	Helicopter Landing Diagram / Route Diagram
TAB N	PZ Diagrams
TAB P	Insert LZ Diagrams
TAB Q	Extract LZ Diagrams

Appendix C

References

FM 71-100-3 *Air Assault Division Operations*

FM 90-4 *Air Assault Operations*

FMFM 6-21 *Tactical Fundamentals of Helicopterborne Operations*

FMFM 5-35 *Assault Support Helicopter Tactical Manual* (NWP 55-9-ASH)

MCWP 3-24 *Assault Support*

MCWP 3-16 *Fire Support Coordination*

“HAC Overview,” TTECG Handout

MAWTS-1 Rotary-Wing Tactical SOP

Appendix D

Example Planning Products Matrix

Product	Lead / Supporting Planners	Due	Complete
Ground Tactical Plan			
OpOrder	S-3		
Overlay	S-3		
Annex B Enemy / Collections	S-2 / Recon / UAV		
Fire Support Plan Appendix 19	FSC / EFL / AO / EWO		
Annex D Logistics	S-4 / PZCO / HUC / AFL		
Annex K Communications	S-6 / RadBn / All others		
HUC Scheme of Maneuver	HUC		
HUC Overlay	HUC		
RSTA / Advance Force Plan	I/EO / S-2 / S-6 / RadBn		
Landing Plan			
HEALT	HUC / AFL		
Insert LZ Diagrams	AFL / HUC / ITG		
Objective Area Diagram	FSC / EFL		
Connectivity Diagrams	S-6 / All others		
Extract LZ Diagrams	AFL / HUC		
Contingencies	HUC		
Advance Force Plan	I/EO		
Execution Checklist	AMC		
Communications Card	AMC		
Mission Timeline	AMC		
Air Movement Plan			
Routing Plan	AMC		
FARP Plan	AMC/AGS		
Load Plan			
HWSAT	HUC		
Staging Plan			
PZ Diagram	PZCO		
Bump Plan	HUC		

Appendix E

Example Brief Format

O	Time Hack Pen Changes Orientation / Task Orientation	S-3
S	Enemy Collection Plan	S-2 S-2A
M	Mission / Intent	MC
E	Execution HUC Scheme of Maneuver / Insert Aviation Concept of Operations Fire Support Plan Air Fires Assault Plan PZ Plan	S-3 HUC AMC FSC EFL FAC(A) AFL PZCO
A	Logistics / Resupply Waves CASEVAC	S-4
C	Communications Plan	S-6

